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Dr. Cattell published the first measurements of individual differences, a work making the

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Author of a number of articles in the field of business psychology and is joint author of a book on *Psychological Tests in Business.*

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Author, *Employment Psychology*, now in seventh printing, and *Education and Industry* reviewed in this volume. Has written numerous articles for technical and popular journals.

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Joint author, with Dr. Rudolf Pinter, *A Scale of Performance Tests* and has contributed a number of research articles on applied psychology in various psychological journals.

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Author, *Experimental Psychology, The Sense of Taste* and in collaboration with H. L. Hollingworth, *Applied Psychology*.

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Co-editor *Readings in General Psychology* and author or co-author of articles on trade tests, intelligence tests, memory, loss of sleep, work and fatigue, and play and other compensatory activities.

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Editor, Harpers Salesmanship Series, and Co-editor Harpers Insurance Library; author, *The Project Method of Teaching; Meeting Objections, Selling Life Insurance, Constructive*

Salesmanship, Problems and Projects in Salesmanship; co-author of the Y. M. C. A. Life Insurance Course.

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Author of about fifty mental tests and vocational guidance tests.

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Author of various articles on industrial psychology in technical and other journals.

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Author, *The Dancing Mouse, A Study in Animal Behavior; Introduction to Psychology; Methods of Studying Vision in Animals* (with J. B. Watson); *Outline of a Study of the Self* (with D. W. LaRue); *A Point Scale for Measuring Mental Ability* (with R. S. Hardwick and

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Human Nature in Business

By C. H. CRENNAN

ANOTHER book on psychology calls for a prefatory statement if not for a plea of confession and avoidance. "Business men are oversold on psychology," said one of the most prominent psychologists in the country. And there was no beguiling him into filling any of the space between the covers of this volume. "The word *psychology* in a title will sell any book." This fairly represents the opinion of a publisher who prints books for profit. Members of the Editorial Council of *The Annals*, almost to a man, seemed unusually interested in the outline of this number. They had ideas—too many ideas to be developed and reconciled in one volume.

AT the heart of every business situation is a human nature problem. Business men know this. They do not need illustrations. Each can think of incidents in point from his own experience.

Business is a game of men. Business men know this also, and act accordingly. The schools teach precept and principle to which business men do lip service. But in the pinches they manipulate men. And not all men are equal, by birth or training. Most just get by. Mediocrity is popular, or at least prevalent. Some men rate high in particular brands of courage, at times, while most range fearfully low.

Some leaders in business add good judgment to courage at least 51 per cent of the time. The combination makes them leaders. Some men are fools—and business is a game of men.

PSYCHOLOGY is a maze of mystery and magic to most of us who are laymen. It sometimes seems to be even to the professionals. The old-fashioned psychology that we studied in school has been upset by the functionalists, the instinct crowd, the Freudians, the behaviorists, the intelligence testers and psychiatrists. We are confused if we try to follow the latest fashions in the field. But we are assured that psychology has wonder-working power and that it *can* be applied in business, with profit.

PSYCHOLOGISTS are special students of human nature. Theirs is the task to take some of the mystery out of psychology, to tell what it is and how it can be applied in business. Theirs, also, is the task of showing what has been done, as well as what reasonably cannot be expected of them. The writer, therefore, leaves this volume to Dr. Kingsbury and the other psychologists who have so generously given of their time. He feels sure, however, that readers of *The Annals* will find much of interest and of use. The psychologist is in business to stay because business involves human nature.

Applying Psychology to Business

By FORREST A. KINGSBURY

THAT psychology, in the past ten years, has come to be a subject of tremendous interest to the business man as well as to the general public is too well known to need proof. Instead of being merely a dry-as-dust branch of arm-chair philosophy, psychology has become a vigorous participant in the world of practical affairs. It is now a science giving great promise of future service. There are many reasons for this sudden change. Partly it is due to the growing recognition of the "human nature factor" in business situations and to a demand for more exact knowledge about this factor. But largely it is due to changes within psychology itself.

SIGNIFICANT CHANGES IN PSYCHOLOGY

Only a little more than a generation ago the first psychological laboratory was founded and psychology came to be recognized as an experimental science instead of a subdivision of metaphysics. But even more recently, psychologists have reconceived the purpose of their study. More and more they are attempting to understand the causes and conditions of human conduct, rather than merely to analyze and catalogue subjectively observed mental states. Psychology has definitely aligned itself with other biological sciences as a study of the ways in which the organism adapts itself to its environment. One recent school of psychologists, calling itself "behavioristic," goes so far as to disclaim any interest whatever in "mind" and to assert that its whole study is human *behavior*. This includes both those

kinds of behavior with which the individual starts his career — his reflexes, instincts, emotions — and those he acquires in the course of his life — his habits of action and habits of speech, including "thought."

Still another group of workers, out in that vague borderland of mental life which we call "abnormal" or "pathological," have contributed ideas and methods which are proving surprisingly helpful in understanding "normal" human beings. They have helped to turn a flood of light on those non-rational factors which play a mysterious, yet powerful rôle in the background of human mentality. Thus they have helped us to understand that man can be called "rational" only by virtue of his potentialities, not because of his fulfillment. They have shown us that not all conduct is explicable in terms of conscious trains of causes and that, if any case of human behavior is logical and rational, it is the exception rather than the rule.

But most significant of all, psychologists themselves have shown an interest and a competency in helping to solve practical problems, first in the field of education and later in the fields of medicine, law, business and administration. They have proved conclusively that they have something important to contribute to each of these fields. Perhaps the work of American psychologists during the war did more than any other one thing to demonstrate the feasibility of drafting psychology into practical service, although this is by no means its only contribution to practical affairs, and perhaps not even its greatest.

HAS PSYCHOLOGY BEEN OVERSOLD?

There is a danger that psychology is suffering from too much popularity. Some fear that it has not merely been sold to the public, but that it has been oversold. Undoubtedly, a vast amount of sheer rubbish is poured out on an indiscriminating public in the name of psychology, with regrettable effects. This cannot be charged up against the many really able and conscientious workers who have made scientific psychology what it is today. Nor can an untrained public be wholly blamed for not being able to distinguish between fiction and fact. Rather must we regard this condition as an undesirable yet unavoidable incident in the maturing of a young, vigorous science. Other sciences have experienced similar growing pains. Physiology, for example, two generations ago suffered from the same sort of exploitation. The effect has been to discredit unnecessarily the term "psychology" and all its associations in the minds of some intelligent people who have failed to distinguish between what is sound science and what is nonsense.

Most of the blame, probably, is to be placed upon the promulgators of the innumerable varieties of fake psychology which are being foisted today upon an uncritical public. "Psychology" is associated or confused with all sorts of notions and practices, good or bad, true or false—telepathy, spiritism, hypnotism, character-reading, dream-interpretation, mental tests, auto-suggestion, clairvoyance, occultism, will-training, mind-power, and nobody knows how many more. Anybody who claims to be a "psychologist" can be sure of a hearing from large sections of the public, and so many quacks, mercenary or merely ignorant, are exploiting the public, that reputable psychologists feel that they must protest

against the abuse of the term. The Psychological Corporation has announced¹ as one of its functions that it will help business men and others to learn who are really recognized, competent psychological investigators, and (by implication) who are not.

Probably psychology has been discredited to some extent by the promiscuous, popular use of the term "psychology" in all sorts of connections, legitimate or otherwise. Most people think of whatever is "psychological" as indicating the presence of certain forces or causes which influence conduct in some invisible fashion. Beyond this, it is difficult to specify just what it does or does not express to those who use the term glibly but without knowledge. Subtle influences set going by insidious schemers, psycho-analytic vagaries, the profitable manipulations of the shrewd observer of human foibles—"psychology" may mean any of these more or less dramatic things. Busy little journalists prate volubly about the "psychology" of war, of baseball, the divorce court, the stock market, prize fights, even of bobbed hair—and the public follows the cue. There is hardly a worse overworked or misused word in the language and this misuse does not make it more popular with the critically-minded business man.

Part of the blame must doubtless be laid at the door of earnest but incompetent workers with tests and other psychological devices. In psychology, as elsewhere, "a little knowledge is a dangerous thing." While it is very easy for one with little or no technical training to administer and score psychological tests of various kinds, after a fashion, such persons lack that thorough psychological training which is necessary to make their interpretations sound. Extravagant claims of

¹ See page 166.

some workers with psychological devices are the occasion for much criticism.

But even reputable psychologists cannot wholly escape blame. Optimistic writers and investigators, in the earlier days when they failed to realize the danger, have let their enthusiasm commit them to incautious statements. If these have not been actual exaggerations, they have at least been insufficiently guarded, thus permitting misinterpretations in the minds of uncritical readers. In this way much that has been little more than rather promising hypothesis has been played up as achieved fact.

In spite of all these sources of misunderstanding and misinterpretation, the fact remains that much of genuine value has been done and that new fields of application are being opened up constantly. To give a careful estimate of the actual achievements of psychologists in business undertakings is the purpose of this volume. It will not be a spectacular story; rather a recital of painstaking, prosaic inquiry, in which perspiration has outbulked inspiration. Nevertheless, such work has enabled psychologists to supplant speculation with hard facts.

TWO PSYCHOLOGICAL LANGUAGES

Anyone who reads recent psychological literature will find that it uses two rather distinct languages. The man who studied Noah Porter's *Human Intellect* in college forty years ago is likely, if he picks up such a book as Watson's *Psychology from the Standpoint of a Behaviorist*, to find almost nothing familiar in it. The differences are not due merely to the knowledge added during the past forty years. The difference goes far deeper. The older psychologies spoke the language of "introspection." They described in detail the mental states which one

finds on looking into his own inner processes. They analyzed these processes at length into their more and more elementary components. On the other hand, much psychology of today talks the language of "stimulus" and "response," of "neural arcs" and "action patterns." It has little or nothing to say about what one sees in his own mind, but much to say about the sort of modifications of behavior one can witness in the human animal upon altering the environmental factors which stimulate him to activity.

A good deal of breath and ink has been expended in controversies between the extreme advocates of these two types of psychology. But after all, they are not wholly irreconcilable. A good many psychologists insist that both methods, the introspective and the objective-experimental, are valuable, and that the two methods should be thought of as really supplementing rather than contradicting each other. The one describes my "mind" as it looks from the inside—as it appears to *me*, the one who is having these experiences. The other describes my "mind" as it is manifested in outward behavior, or is conditioned by processes in the nervous system—as it appears to the outsider, who looks on but not in. The reader will find both of these languages spoken in different articles of this volume. Some talk about "feelings" and "desires" and "satisfactions"—terms which have direct significance to one who is having these kinds of experience, but which any outsider is forever debarred from sharing. To the external observer these are exhibited only as peculiar kinds of preferential behavior. True, he may translate this behavior into terms of his own subjective mental life if he chooses. But after all, to talk of any other person's consciousness is interpretation, not observation. Other

writers in the volume will be found who never so much as mention a "conscious state," but talk altogether about how individuals act under given circumstances. One need not be confused by this disagreement of language. The difference is largely one of interest and emphasis. Doubtless there are times when each of these two methods of describing that peculiar succession of events which we call "mental" has its advantages. It is probably true that for most practical purposes we are more directly concerned with people's actions than with their subjective states. But probably most of us are sometimes interested in watching our own minds, as well as the manifestations of mind that we see in others.

APPLIED PSYCHOLOGY AND PURE PSYCHOLOGY

Business psychology, like educational psychology or legal psychology or medical psychology is, of course, a division of "applied psychology." This is not a special kind of psychology with laws different from "pure psychology" or "theoretical psychology." Nor, on the other hand, is it identical with pure psychology. The two are related in much the same way that any of the numerous science-technology teams are related, such as botany and agriculture, physics and mechanical engineering, astronomy and navigation. A science is an organized body of knowledge, facts, principles, laws. A technology is a more or less loosely related assortment of scientifically tested rules for accomplishing certain practical ends. So with pure psychology and applied psychology. As a pure science, psychology is not concerned with practical utility, but merely with increasing, verifying and organizing our knowledge about mental life or behavior. Psychotechnology, or applied psychology, is interested in acquiring facts and prin-

ciples only in so far as they can be turned directly to account in the solution of practical problems, in industry, selling, teaching, or other fields of human endeavor.

But while pure psychology and applied psychology differ materially in their aims, their methods are very similar, and the sort of technical training which fits a man to be a good experimental research man is likely to stand him in stead when he turns to problems from practical fields.

As in all other technologies, the practical problems which invite the psychologist's attention are soon found to run out into and interweave with other sorts of problems—economic, administrative, personal, social, political, what not. Just as the chemical engineer has to know more than chemistry in order to devise methods which will be successful, economical and in every way practicable, so the psychotechnologist finds that his problems lead him into fields far from the psychology of the laboratory. Indeed, no branch of applied psychology can be so sharply delimited as is a pure science, which elects what it will study and what it will ignore. As every business problem presents its own peculiar, individual aspects and circumstances, so business psychology cannot present a clean-cut set of rules to be followed in every case. The reader of this volume is likely to be impressed by the frequent reiteration, in effect if not in words, of the assertion, "There are no ready-made formulas for this type of problem." The psychologist has to take into account a great deal more than psychology to make his psychology of value. The contributions of psychology to business are in many ways indirect and are highly varied in nature. Nevertheless, it may not be amiss to mention some of the general ways in which a thorough training in and

understanding of scientific psychology may aid one in solving "human nature" problems in business.

THE PSYCHOLOGICAL VIEWPOINT

In the first place, one can often throw a flood of light upon a business problem by looking at it from a psychological *viewpoint*. One can contemplate any business problem from many different viewpoints—from a personal viewpoint, a dollars-and-cents viewpoint, an ethical viewpoint, a political viewpoint, or any other viewpoint. In each case he sees things about that problem that he did not see when he looked at it from some other angle, although we must admit that frequently we are able to look at a problem from only one viewpoint, that dictated by our past training and present interests. In other words, we all have "blind spots." But the psychologically trained expert, turned loose on a labor problem or a marketing problem, sees, as a result of his past training and present interest, certain things which others are not likely to see, and yet may be very valuable in finding a satisfactory solution.

It is not easy to define what we mean by a "viewpoint." It is easier to have one and know what it is than to tell how we got it or to define it. One's psychological viewpoint is the product of all that body of psychological facts and principles that he has mastered and have so permeated all his ways of thinking that they constitute the framework into which he fits all his new ideas, or the colored spectacles through which he views new experiences. To give a complete account of a "psychological viewpoint" would involve a complete summary of the science of psychology. But there are certain outstanding characteristics which may be mentioned as indicative of its nature.

The psychological viewpoint is scientific, empirical, critical. It is not content to evolve a beautiful theory in the seclusion of the study and adopt it as a final explanation. It insists that theories must be put to practical test. It withholds judgment until evidence is in and it accepts nothing on mere hearsay or tradition.

The psychological viewpoint regards all human conduct as the outcome of perfectly definite causes. It never dismisses a problem with the generalization, "You can never explain human behavior or the human mind." True, the causes may be so complex or so obscure that we cannot get at them, but the psychologist is certain that they are there and at work, even if he does not have the means of unearthing them. He is also certain that *wherever those precise causes operate, identical results will follow*. Hence, he says, his object as a psychologist is to learn to predict and thereby to control human behavior.

The psychological viewpoint leads one to view behavior in terms of "situation" and "response." The "situation" which determines any act is twofold: it involves some external stimulus and also a certain kind of internal organization of nerve tracts and centers, the result of inheritance or of training and experience. The "response" is the conduct, either action or thought, which follows when that particular kind of nervous system is played upon by that particular stimulus. These conditions, external and internal, are of course exceedingly numerous, varied and complex. Therefore, one of the psychologist's tasks is to learn to analyze the whole situation, pick out the essential from the non-essential factors and deal with them one at a time.

Just one other characteristic will be mentioned. The variability of indi-

viduals, when compared with one another as to any particular trait, and the usefulness of expressing those individual differences in some sort of quantitative terms, is one of the tenets which the applied psychologist has had so thoroughly drilled into him that it determines the nature and direction of his thinking about human beings. He sees differences instead of merely likenesses between people. He thinks of them moreover, not merely as "different," but as exhibiting *more* or *less* of whatever quality he is interested in observing. Hence so-called "individual psychology" constitutes an important part of applied psychology.

APPLYING PSYCHOLOGICAL PRINCIPLES

There are also certain *principles* and *facts*, the common property of psychology, which can be utilized directly in the solution of business problems. The laws of habit formation as described in any textbook are directly applicable to many practical situations. So also with what we know about the laws of effective memorizing. What we know about the operations of the eye permits us to infer quite directly certain conclusions about the most effective types of illumination. A score of other illustrations might be mentioned.

One example of the way in which certain recognized psychological analyses can be applied directly to business is in the analysis of what is often called "business judgment." Far from being an elusive mystery, the thought processes by which one arrives at a conclusion are comprehensible to the psychologist and he can therefore suggest practical devices by which one's thinking habits may be made more effective. Such an analysis as Dewey has made of reasoning in his book, *How We*

Think, or as the writer has elsewhere presented,² reveals such factors in the operation, either explicit or implicit, as the following:

(1) The presence of an unsolved problem, which stimulates thinking and determines its direction;

(2) The clear definition of the problem, by analyzing the situation into its significant and non-significant factors, under the guidance of one's knowledge about the facts in the case and what they ordinarily signify;

(3) The suggestion, via ordinary associative processes, of hypothetical solutions for this problem, their number and value depending, of course, on the background of experience and ideas about this kind of subject-matter;

(4) The elaboration of these solutions into their probable consequences and the evaluation of each—again a matter of associative suggestion, plus the agreeable or disagreeable response produced by the various ideas as they come to mind;

(5) The final withdrawal of attention from all but one solution and the eventuation of that in action.

As a rule, however, that sort of "applied psychology" which consists in the direct application of comprehensive psychological principles to practical problems is of rather limited scope. Most business problems are far too complex to be completely explained by reference to any one psychological principle, or even to several. Most principles are too general in their formulation to be very directly useful in solving problems, which are always specific. Still other psychological principles are found to be too limited in their field of possible applicability to be of very wide serviceability. Nevertheless, one who has read intelligently

² "Business Judgment and the Business Curriculum," *Journal of Political Economy*, June, 1922.

a modern textbook on psychology does find that it throws much light on many problems which were previously obscure.

ADAPTING PSYCHOLOGICAL TECHNIQUE

Undoubtedly the greatest contribution that psychology makes to the solution of business problems is its *method* or *technique*. After futile attempts to pattern their procedure according to that of certain of the older empirical sciences, psychologists have at last gradually perfected methods of experimentation and measurement suited to their own peculiar materials. In the past these methods have been used chiefly to establish or to test general theories and thus to enlarge the body of psychological knowledge. But the methods have proved equally fruitful in dealing with "human nature" materials where the aim is not to establish general laws but to meet practical difficulties.

Psychological experimentation, of course, has a good deal in common with experimentation in other fields, but it has much that is peculiar to itself. Like every empirical science, psychology formulates hypotheses to explain facts, and then tests out those hypotheses by controlling all the conditions, varying one at a time, and carefully observing the results. If experimentation produces results which are in harmony with the logical implications of the hypothesis, it helps to confirm the hypothesis; and if this still stands after prolonged and repeated test, it comes to be regarded as a proved theory. If, on the other hand, the hypothesis fails in some respect, it has to be modified or perhaps even abandoned. At any rate, an empirical science stands by hypotheses and theories only so long as they prove themselves the best explanations of the facts at hand. Similarly, the careful

psychotechnologist submits his hypothetical solutions of concrete problems to prolonged and severe experimental tests before he is willing to announce the problem as solved.

Psychological experiment makes use of many devices and takes many precautions which are peculiar to psychology, or at any rate to the biological sciences. The elimination of many sources of error (such as variations in time of day, or in verbal instructions to the subject), the use of control groups, the use of large groups to insure reliability, the use of peculiar instruments of precision and the methods and language of exact numerical measurement suited to human materials, the repetition of trials under changed conditions—all these are characteristic of the work of the careful psychological investigator, whether he is trying to substantiate an intricate theory or to find a better method of selecting skilful machine operators.

In dealing with large groups, as the psychologist must usually do in order to bring the factor of individual variability under control, he makes use of another sort of instrument, statistical method, with its various ways of measuring and giving expression to central tendencies—averages of various sorts—variability and correlation.

There are, of course, many forms of "mass behavior" which, because they are so complex or so transitory, the psychologist cannot subject to the usual experimental controls. In such cases he can only observe carefully and report accurately what he sees. Often these phenomena, while in a loose sense psychological, belong rather to the realm of some special social science, such as economics, history or sociology. Usually the psychologist claims no special right to report and interpret these phenomena. He prefers to let them be treated as economic, historical

or sociological problems, and to confine himself, as a psychologist, to those problems where his special technic is most useful. He does, however, believe that the economist, historian or sociologist who is capable of adopting a psychological viewpoint and who is familiar with well-established psychological knowledge, will be more competent to interpret those phenomena correctly than if he is ignorant of scientific psychology.

THE PROFESSION OF PSYCHOTECHNOLOGIST

We have said that psychological technic is of central importance, while direct application of psychological principles is secondary. This means that psychological work in industry, if it is to be of any value, must be done by trained psychotechnologists, and not by amateurs. The answers to psychological problems cannot be read out of a book. They have to be worked out on the ground, in terms of prevailing conditions, by professionally trained experts, just as the problems must be which call for the services of the physician or the engineer.

Whether the rising profession of psychotechnologist will turn out to be more like that of the physician or of the engineer is a question which has not yet been answered. It was the contention of Münsterberg, one of the pioneers of industrial psychology in America, that the consulting psychologist's function is comparable to that of the consulting engineer, in that his concern is with the devising of means, not with the setting of ends and determination of policies. But the materials and problems with which the psychological engineer works are very different from those with which the civil or architectural engineer works. The introduction of the delicate human factor seems to justify him in con-

sidering the value of the ends which he is set to realize, as well as in determining the most effective means. He cannot be *merely* a psychologist; he must be a *man* as well, with a keen sense of ethical and social values. This condition has come to prevail in the medical profession. The physician's ethical code forbids him to do certain things which his professional skill enables him to do. Just what sort of ethical code the new profession of psychotechnologist will develop remains to be seen. But it is at least conceivable that he may reserve the right to pass judgment on the social and ethical consequences of the policies which he is asked to help put into effect, and upon the ethical as well as the economic value of different sorts of psychological procedure.

PROBLEMS FOR THE BUSINESS PSYCHOLOGIST

Problems in business which lend themselves most directly to a psychological approach, in which definite results have been achieved by psychologists, are many and diverse, as the articles in this volume will show. Nevertheless, they do fall into two main divisions, corresponding to the two major types of human relationship which prevail in business: first, the employer-employee relation, and second, the seller-buyer relation. These two types of problem define two major sections of the volume. Another section is devoted to the description of certain administrative agencies by which psychological research in business is being carried on. While reference to the table of contents will indicate readily the relationship of these various special problems, they will be mentioned briefly in order.

PROBLEMS RELATING TO LABOR

The problems which arise from the employer-employee relationship are

sometimes classified as problems of selection and of maintenance. Business men use many different methods of trying to pick out the most suitable workers for certain positions. Some of these methods are fairly reliable, while others probably are of little value. Psychologists have worked out a fairly effective technique for evaluating these selection methods. Several of these are described in various articles in Section I. Following a critical examination of certain commonly used selection methods—interviews, letters of application and the like—four articles deal with selective methods which are definitely scientific in character. One is on the job analysis for employment purposes, by means of which the requirements of the various positions are accurately determined. Three describe the construction and use of tests—tests of trade proficiency, tests for industrial occupations and tests for office occupations respectively.

The many "systems" claiming to teach the business man infallibly to judge the character of employes, applicants and others, at sight, next call for critical examination, while methods which psychologists have worked out for rating personal qualities are described in another article.

But even when the worker's efficiency has been reliably determined, employment difficulties are not all overcome. The employe's value to his employer, as well as his own happiness, are dependent upon the maintenance of favorable conditions, both external and internal. The influence of certain environmental conditions on output has been an actively worked field, particularly by British psychologists. These conditions and the methods of studying them are enumerated. Far less of real scientific merit has been accomplished in the way of understand-

ing the *internal* conditions of efficiency—the attitude of mind of the worker and the factors affecting it. True, a vast amount has been written on this topic, much of which is pseudo-psychological—or worse—and almost all of which is based on opinion rather than upon experiment. Achievements in the way of actual, experimentally demonstrated facts about human motives are almost nil. The two articles which deal with "The Motives-in-Industry Problem" and "The Irrational Factor in Human Behavior" do not profess to solve, but only to state these problems as psychologists see them.

PSYCHOLOGY AND THE CONSUMER

Marketing offers a field of special interest to the psychologist. Probably the earliest incursion of the psychologist into business was Scott's attempt to describe advertising in psychological terms. Since then several important books on advertising have been written by professional psychologists and a definite technique has been worked out in this field.

Following an analysis of the mental processes of the buyer is a description of certain types of scientific technique in advertising. In the field of personal selling, psychologists have done less, although in every good book on the art of salesmanship there is a good deal of psychology implicit, some of which is made explicit in the article which follows.

Section III closes with a statement of certain psychological principles involved in saving, a point which suggests to the economist a wide range of topics concerning the important sources of capital, the methods of its accumulation and other related economic problems, which, however, are not discussed.

AGENCIES FOR PSYCHOLOGICAL RESEARCH

Psychological research in business has been and is being administered through a variety of agencies, public, quasi-public, or private, independent or coöperative. It is impossible, of course, in a volume of this size to describe or even to mention all of the agencies at work. Certain types, however, have been selected for discussion in the third section of the volume. The work of the psychological department within the individual establishment has not been discussed in this connection, because the few definite, uniformly true statements that can be made about such procedure are implied in many earlier articles.

Concrete descriptions of psychological work being done in two specific fields are described, by way of illustration, in the articles dealing with the insurance field and the civil service. In this connection the rôle that psychology plays in the business training offered in schools of business administration is of interest. The section and volume close with a bird's-eye view of the very significant work in industrial psychology being done in England, France and Germany.

PROSPECTS FOR PSYCHOLOGY IN BUSINESS

The lines along which future developments may be expected cannot be predicted with accuracy. There are many problems of human nature for which no adequate methods have yet been worked out. In some cases this is because they are too complex or too elusive for effective control. In other cases, any effort at experimental control would essentially alter the situation and invalidate the results. In some directions tentative suggestions have been made; in others, no feasible modes

of attack have yet presented themselves. Undoubtedly some of these will be subjected to experimental investigation some day. The psychology of credit and credit extension, the psychological factors in the business cycle, the relative efficacy of different wage-systems, the psychology of value, the resistances which consumers consciously or unconsciously set up against the seller's attack, the psychologist's part in preventing or settling labor disturbances—these and a host of other problems sing their siren songs to the ambitious investigator. Many of the problems mentioned were discussed in planning this volume but were abandoned because conclusive work on them is yet to be done.

More promising is the prospect for more extended and more conclusive work in fields already broken. Those familiar with the literature of business psychology may wonder at the omission of any reference to tests for salespeople, psychological studies of trademarks and package labels, the psychology of vocational training, and a large number of other fields in which significant beginnings have been made but little conclusively completed. Indeed, what is omitted from this series of articles is hardly less interesting or significant than what has been included. Problems have presented themselves in vastly greater abundance than methods for their solution or workers to solve them can be made available. What has been done is only a beginning, for industrial psychology is just finding itself.

What is especially needed is greater opportunity for experimental research *under actual business conditions*, in the workshop, the office, the store. Only by making these serve as the actual laboratories can we be sure that our findings will be practically useful in the highest degree. It is not always easy

for the capable investigator to obtain ideal conditions for research, even on the most important and most practical problems. Business executives, being human, are subject to tides of enthusiasm over research projects—to their ebb, as well as to their flow. Sound experimental research is not accomplished in a moment or a day. It takes a long time, even under the most favorable circumstances, to accumulate a body of clean-cut, accurate, unambiguous facts. It takes still longer for a revised procedure, based on those facts, to begin to show visible results in the way of greater output, larger

sales, increased economies, swelling profits. All this demands *patience*, more patience than our hurrying age, with its imperious demand for quick returns and large profits, is ordinarily willing to exhibit. It calls also for a scientific spirit on the part of business men, the impartial, critical, yet hopeful spirit which insists on proof, and yet is willing to abandon cherished prejudices when proof is forthcoming—the spirit which is willing to persevere in scientific inquiry even in the face of negative results, in the confidence that, since science has given many good gifts, she has still more to bestow.

A Critical Examination of the Usual Employment Methods

By A. T. POFFENBERGER

TWO kinds of reformers have been recently defined: "First, there is the kind who calls himself a reformer and wants to smash things. He is the sort of man who would tear up a whole shirt because the collar button did not fit the buttonhole. It would never occur to him to enlarge the buttonhole. . . . On the other hand, we have a different kind of reformer who never calls himself one. He is singularly like the radical reformer. The radical has had no experience and does not want it. The other class of reformer has had plenty of experience but it does him no good. The one wants to smash up the whole world in order to make a better one. The other holds the world as so good that it might well be let stand as it is."

A layman looking upon the changes taking place in vocational methods might get the impression that the parties interested in vocational work are analogous to the two classes of reformers above described. One class would seem to be promoting an entirely new system of methods, discarding the old as worthless, while the other insists on clinging to the old and will have nothing to do with the new. The former group offers quantitative methods of measurement and classification while the latter is satisfied with qualitative distinctions and groupings. The latter would consider it sufficient to know that a candidate for a job is diligent; the former would insist that diligence, if it exists at all, can be measured and that its amount should be expressed in quantitative terms. While one group might believe that brunettes make good salesmen, the other would insist

on getting a quantitative evaluation of the degree of skin pigmentation indicative of good salesmanship.

QUALITATIVE AND QUANTITATIVE MEASUREMENTS

This same sort of apparent antagonism between qualitative and quantitative may be noted by an observant layman in the case of medical diagnosis. Diagnostic signs forming the picture of a disease, such as rapid pulse, fever, lack of appetite, go hand in hand with accurate quantitative measurement of blood-pressure, blood sugar, corpuscle counts, etc. As knowledge increases in the field of medicine, the former type of diagnosis gradually gives way to the latter.

Now there is no sharp distinction or necessary antagonism between the qualitative and the quantitative in vocational methods. Measurement is implied in both. In the former the measuring is so crude as to often pass unnoticed; no measuring device is apparent. But to say that an individual is a brunette requires that he be evaluated on a scale of skin color however crude the scale may be; to say that a patient has fever implies a background of experience of temperatures against which the particular case may be viewed and evaluated. When this background of experience is objectified, stabilized and broken up into small units, we have the qualitative shading over into the quantitative.

From the foregoing it appears that the difference between the two kinds of reformers in vocational work is reducible to a question of the fineness or the accuracy of the measurement which

they advocate. Fine measuring involves the use of fine tools and accurate technique, and it is the labor expended by the vocational expert in the preparation and use of his measuring devices that constitutes the main difference in the activities of the new and the old school.

Some human traits are more easily measured quantitatively than others. Some have fairly objective and stable manifestations such as the ability to do arithmetical computations, to write on the typewriter, to file cards or to turn out work on a lathe. They leave a record in the form of answers to problems, sheets of typed material, cards filed in their proper places and correctly machined work. Other traits are much more subjective and elusive in character, such as honesty, cheerfulness, loyalty, etc. They exist only as they make an impression upon one's associates; they reflect themselves most directly in the opinions of those with whom one comes in contact. Their objective manifestations are likely to be remote and intangible.

It is the former objective sorts of traits that have been subjected to fine measurement, by means of tests, the popular quantitative measuring device. The latter type has not yet been found to be susceptible to the same objective test methods. It is just these more subjective sorts of traits that the traditional employment methods have been used to measure. Since these human characteristics are of unquestioned importance in vocational success, it is well to scrutinize carefully the older and more conservative methods of detecting their presence before discarding such methods as worthless. Perhaps with the application of the principles used in the development of tests, together with changes in the technique of their construction, administration and scoring, we may still

make them effective measures fit to take their place along with the more objective vocational tests or at least to render useful service until genuine tests are developed.

The outstanding characteristic of the vocational test methods is standardization: standardization of material; standardization of administration; and standardization of scoring. In contrast, the outstanding characteristic of the traditional methods seems to be lack of standardization, entire dependence being placed upon the whim of the user. Letters of application are dealt with according to the variable humor or notion of a single reader, interviews are conducted and applicants chosen or rejected because of personal prejudices of one judge, letters of recommendation and testimonials are written in a perfunctory fashion and weighed as evidence in an equally perfunctory and unsystematic manner.

A CRITICAL SURVEY OF EMPLOYMENT METHODS

In making a critical examination of these and other methods of measuring human capacity, there is one general rule that it seems fairly safe to set down and with which vocational indicators of all sorts should comply. That is, *they should be measures of conduct or behavior and not of some fixed anatomical or physical trait*. Possible exceptions to this general rule will at once occur to persons familiar with the vocational literature. For example, the successful executive is said to be above the average of the population in height. This is, however, far from saying that height is a determining factor in executive success, that is, that tall men have more than average executive capacity while short men have less. Other physical traits, such as color of hair, color of eyes and texture of the skin, although frequently

used as vocational signs, have never satisfactorily withstood tests of their validity.

Leaving out physical traits, human conduct offers an almost unlimited source of material for vocational measurement purposes, especially when the term is made to include conduct crystallized in the form of work done, words written, features molded and shaped, if this be possible, through frequent activity and use. But a further rule must be applied which limits the field rather narrowly, namely, that *the conduct or behavior must be significant*. If, for example, one is seeking to measure aggressiveness, not all forms of behavior can be taken as significant, although it may not be safe to discard any until each has been tried out. Only painstaking investigation will, I believe, reveal those forms of conduct that are indicative of any particular characteristic.

Still a third rule must be complied with, namely, that *the measurement of the significant conduct must be adequate*. If it should be found after careful examination that ability to look one in the eye is an indicator of aggressiveness, it will not be sufficient to say that one can or cannot do this. It is not a characteristic that is either present or absent, but one that is possessed in varying degrees by all persons. It will be necessary to determine how long or how steadily one must be able to control his gaze in order to be called aggressive, and to determine whether ability to stare another in the eye and aggressiveness are so positively correlated that the more one has of the one trait the more he must have of the other and vice versa. In other words, it is likely to be not a question of "yes" or "no" but of "how much" or "how many."

With these facts in mind let us make a survey of some of the customary em-

ployment methods, beginning with a very simple case.

First Impressions of Applicants.—

Many employers of men boast of their ability to judge correctly the fitness of an applicant for a job upon the first impression which he makes, the way he walks into the room, introduces himself, shakes hands, sits down, the manner in which he carries on a conversation, meets a rebuff or the like. If we exclude all estimates based upon physical characteristics, we are dealing here, certainly, with forms of conduct, and a quick survey or estimate of this conduct is possible. Is the conduct thus observed significant? This is a question which cannot be answered unless we know for what it is to be an indicator. If the applicant wishes to be a salesman, a social secretary or occupy a similar job where brief and frequent human contacts are necessary, the character of the first impression which he makes may be very significant. It may well be that in certain types of selling the first impression which the individual makes has much to do with his success. Here, then, we are simply measuring a sample of the kind of reactions which the individual is being employed to make. To the extent that it is an adequate representation of his future work, it is significant. If, on the other hand, the applicant is being considered for a position as accountant, clerk, office manager, or skilled workman of some sort, the case is not so clear. We are in such cases no longer dealing with samples of the occupation, but with symptoms, more or less remote. First impressions cannot, therefore, be considered significant until proven so, and they are almost certain to be found of no value whatever.

Coming to the application of our third rule, we may inquire whether the measurement of the conduct in

these first impressions is adequate. Does the employer or employment manager properly gauge the impression that the applicant will make upon his customers? He is very likely not to. The unchecked reaction of any one human being in a case like this is likely to be subject to a great variety of prejudices. Dislike of red hair, a long nose, a preference for blondes, for tall persons, for snub noses and other non-significant traits may have a subtle influence on the judgment. As it is not likely that all persons will be subject to the same idiosyncrasies, the reactions of more than one person (the more the better) would seem to give a more reliable measure of fitness. Since the efficiency of the applicant will depend upon the impression that he makes upon his customers, the nearer the judges resemble these customers in number and nature, the more adequate will the consensus of their opinions be as a measure of the applicant's fitness. That employment manager is, doubtless, extremely rare whose reactions to a salesman applicant will be representative of those to whom the individual is to sell.

A further question now arises as to the terms in which the various judges shall record their impressions so that a consensus of opinion may be obtained regarding any one applicant, and in order that any one judge shall be able to record his impressions of several applicants so that the best may be chosen. When more than one applicant is to be considered and only one chosen by the first impression method, it is not sufficient to record "good" or "not good" concerning each. Some finer measure must be employed in order that distinctions may be drawn among the applicants. Some kind of marking system must be employed, some kind of scale, which shall be equivalent for the different judges and on the basis

of which each applicant may be evaluated. The development of some principle upon which measuring scales for such purposes may be constructed¹ is a task which is taxing the ingenuity of specialists in the field of vocational psychology.

Finally, it may be necessary to specify certain qualities that the judges are to look for especially so that over-emphasis may not be placed on any one trait such as neatness of dress, carriage, manner of speech, etc., and so that equally important traits may not be entirely excluded from consideration.

The application of our three rules to judgments from first impression shows, therefore, that such judgments are effective only in the few instances, if any, where first impressions are vital factors in success, and only here when first impressions bulk so large as to constitute a significant sample of the whole job, and when these impressions are registered upon adequate representatives of the applicant's future audience, and recorded in such terms as to make discrimination among applicants possible, and when weight is given to the various qualities judged according to their importance.

First Impressions from Photographs.—When the first impressions gained from actual contact with the individual are replaced by impressions gained from a photograph, the effectiveness of such judgments becomes still more questionable. The real conduct indicators are almost or entirely missing and physical traits take their place. Where personal appearance is an important factor in success, it may be determined in a way from a photograph. But even such a trait as neatness can be judged from a photograph only with a considerable error. Some

¹See article entitled "Methods of Rating Human Qualities."—EDITORS.

studies of photographs have shown a positive relationship between intelligence as judged thereby and as measured by a standard intelligence test. Studies of my own of groups closely resembling, in range of intelligence, those who would be applicants for any one position lead me to believe that the photograph is a very precarious indicator of intelligence. Negative correlations were much more common than positive, and the consensus of opinion of larger and larger groups of judges only served to increase the negative character of the correlation. Examination of the records clearly showed that good personal appearance was consistently mistaken for intelligence. This, no doubt, represents a very common error in human judgment, namely, to associate desirable traits with good personal appearance.

In another study the intelligence of a group of twenty-five persons was estimated from their photographs by ten judges, and these judgments were compared with those made of the same twenty-five persons by their acquaintances. The relationship of the estimates by the different judges of the photographs with the consensus of opinion of acquaintances varied for intelligence all the way from $-.27$ to $+.51$ (When $+1.00$ means perfect agreement, 0 means only a chance relationship, and -1.00 means a perfect negative relationship). The same comparisons for neatness gave a range from $-.09$ to $+.41$ and for sociability from 0 to $+.55$. The median of the judgments for intelligence was $+.19$, for neatness $+.11$, and for sociability $+.18$. If, on the other hand, the photographs are judged by fifty persons and their judgments are all combined, the coefficients of correlation with consensus of opinion of acquaintances are for intelligence $+.51$, for neatness $+.05$, and for sociability $+.29$. Hence,

even where a large number of judges is employed to eliminate individual prejudice there is a great discrepancy between judgments made directly from personal contact and judgments made from photographs.

The Interview.—Very closely related in general character to this method of first impression is the interview. It may be merely a means of getting an impression. The questions may be asked for no other purpose than to afford good opportunity for observing the reactions of the applicant. When the interview is of this nature, the same conditions apply as those described above. But very often the interview is intended to do more than this. It is so conducted as to elicit information concerning the individual's past, his interests, desires and capacities which are thought to have a bearing upon his future success. When of this type the interview must comply with the same rules laid down for first impressions. It should, first of all, deal with conduct and records of conduct. Whether the conduct thus investigated is significant for the purpose is a question which must be determined specifically for each occupation. For in this case we are no longer dealing directly with an actual sample of the kind of performance an individual is to engage in, that is, making a favorable impression, but we are dealing with symptoms more or less remote of capacity to do certain kinds of work. One cannot safely prophesy, without a checking up, whether, in salesmanship for example, certain information about a candidate's past will have any bearing upon his future success, or still less, what is the relative importance of the various items of information thus obtained.

In spite of the importance of the whole question, the value of such symptoms has rarely been adequately investigated. One study has been reported

in which the relationship was determined between success as an insurance salesman in terms of earnings and certain information of a biographical character such as is usually obtained from an interview. Such matters as "Good health," "Time spent in the work," "Amount of schooling," "Marital status," and "Motive for taking up insurance selling," seem to have no bearing on success; while "Having children," "Starting work on commission," "Having outside recreations," etc., seem to bear a positive relation to success. Now such facts as these could scarcely be discovered except by careful analysis of interview data checked against the objective facts of salaries earned. This study represents a form of job analysis which suggests what might be done and is being done in connection with many types of occupation.

Even after forms of significant conduct are discovered, they must form the basis of carefully prepared questions whose answers should be capable of simple and easy record in their entirety and be free from the factor of estimation and personal bias of the interviewer. These answers may then be adequately dealt with and objectively measured so as to get from them their maximum significance, instead of being passed on at the moment with nothing but the opinion of the interviewer as the result of the interview.

Furthermore, it is scarcely likely that all items of conduct found to be significant are equally significant. Perhaps "Having some outside recreation" may be only one-fourth as indicative of insurance selling ability as "Having children," or perhaps their relative importance may be reversed. That is to say, the various items of information must be given weights in accordance with their importance as symptoms of success. The following

are a few relative weights attached to qualities as symptoms of success which were worked out in one practical business organization: Age (within a given range), 3 points; Marital status, 1 point; Schooling (specified number of years), 1 point; Previous occupation (within a certain group), 1 point; Length of time with last employer, 1 point. These are matters which can be determined by one skilled in current statistical procedure and may put value into interview data which are worthless when not thus handled.

That interviews which do not comply with such rules as have been described are failures in a large proportion of the cases is suggested by the few experimental tests which have been made of them. Where equally qualified employment managers are allowed to use their interview methods on the same group of candidates, the discrepancies are surprisingly great. It is not uncommon for the same applicant to be reported by one interviewer as the best of a group of fifty and by another as the poorest in the same group. More frequently still, there is no agreement as to whether a given applicant shall be placed in the poorer or better half of the group. In actual practice such errors are not discovered directly and immediately on account of the lack of any adequate check upon selections. Not only is there no means of discovering the good candidates who failed to be employed but there is no tendency to attribute rapid turnover to the selection of the wrong individuals.

Letters of Application.—The letter of application may be looked upon as a means of submitting a conduct record at long range. Sometimes it serves as a substitute for the personal interview and sometimes as a preliminary for classifying applicants into "possible" and "impossible." In either case to be entirely effective it must comply

with the three rules laid down in the beginning of this paper. In ordinary practice one who is writing a letter of application is left entirely free to choose the general character and the contents of the letter, and upon the basis of it a general opinion of his fitness is obtained. Or, he may be asked to answer specific questions as to his past experience, marital status, age, interests, etc. If the application is of the former type, all that has been said in our discussion of first impressions will apply. Certain additional difficulties must also be taken into account. First, there is the question of the veracity of the applicant. It is not uncommon for applicants to have some one else prepare their letters and to deliberately falsify their contents. This matter cannot well be checked without considerable difficulty. Then too, there is the question of the ability of the applicant rightly to judge himself in regard to the matters upon which he reports. The following quotation sums up very well the facts in this regard: "The individual judges himself less accurately than others judge him, and on the whole self-estimates have only chance accuracy. The individual's judgment is moreover a biased one. He tends to overestimate or to underestimate himself according to the presumed desirableness or undesirableness of the trait. But those individuals who actually possess a given desirable trait in high degree are more accurate in their self-estimates for that trait than are those who possess the trait in lower degree."² These statements refer to the judgment of personal character traits and not to such objective facts as age, previous experience, etc.

When the letter of application is of the latter type, that is, bears information to be evaluated rather than offering merely a basis for gaining a general

impression, it must be dealt with just as the interview data are dealt with. That is, the significant facts must be gleaned from the non-significant and these must be weighted according to their relative importance as symptoms of success. Furthermore, personal bias of the judge must be eliminated by having more than one person give his reaction to the letters. When these conditions are complied with, there is no doubt that the letter of application may be of service. In an experiment of my own where twelve competent judges evaluated each of twenty-five letters of application for a given job, and the consensus of opinion was calculated for all the judges, this consensus of opinion correlated with the actual capacity of the twenty-five people as estimated by those who knew them in their work, to the extent of +.50. In this study the honesty of the applicants was guaranteed. Each one was left free to choose the contents of his letter. Personal bias of the individual judges was eliminated by a consensus of opinion of twelve judges. When due weight is given to the safeguards mentioned and when the *limitations* of a letter of application are recognized there is no reason why it should not be a useful tool in vocational selection.

Letters of Recommendation.—In the case of letters of recommendation and testimonials a third party is introduced into the situation, which constitutes a new source of error and one that is difficult to control. Assuming for the moment, that no new error is introduced by way of the writer of the testimonial, then exactly the same conditions apply as in the cases previously discussed. Significant conduct properly measured so as to eliminate personal prejudices and weighted according to its importance provide useful material for vocational selection.

²Hollingsworth, H. L., *Judging Human Character*, p. 58.

The writer of testimonials and letters of recommendation is likely to view his task rather lightly and for mere accommodation will often exceed his knowledge or falsify it, in writing about a friend or associate. There is no way of checking against errors of this character except to know the character of the writer and to demand testimonials from a number of persons. In the great bulk of cases this is not possible.

Even where actual dishonesty or carelessness is not present the fallibility of human judgment will play a part. Testimonials most often deal with the personal traits of an individual and it is in just such cases that the error of judgment is greatest, even among acquaintances. Experimental studies have demonstrated that the more a trait manifests itself in some objective fashion, the more accurately it can be judged. Such traits as efficiency, originality, perseverance and quickness are most accurately judged, while judgments of such traits as courage, integrity, coöperativeness, cheerfulness and kindness are liable to a large error. The latter in contrast to the former are primarily reactions toward other individuals so that their display depends not solely upon the one person but also upon his acquaintances who vary in the degree to which they elicit these reactions. Here, as in the other cases cited, the only safeguard against such personal bias is to combine the opinions of a number of acquaintances, so that chance errors may be cancelled. Experimental tests have shown that where the letters are honestly written, judged by a number of competent judges, and where previous experience of a candidate is of great significance, the correlation of estimates based on testimonials may run as high as $+ .60$.

The methods described in this paper, when the conditions here laid down are complied with, are measures of con-

duct. They are in reality vocational tests which will measure personal traits that cannot at present be gauged by the more customary tests. But they are no longer the tools of the conservative vocational expert; they carry the ear marks of the radical reformer, namely, measurement and standardization. Their sphere at best is limited. To comply with the rules prescribed involves a difficult and laborious process. The information obtained must be genuine, must be tested for its significance and weighted according to the degree of its significance; methods of recording and scoring the information must be standardized; personal bias inherent in human judgment must be eliminated by employing numbers of judges. To do these things properly none of the elaborate statistical machinery devised for the construction of mental tests can be spared.

These methods offer no short cut to vocational selection. Within their legitimate sphere of service they are worth the labor their proper use would involve. When vocational tests of the more conventional sort can perform the same functions more simply and easily, the more primitive methods should be laid aside in the interest of progress. Until then they should not be lightly thrown away.

REFERENCES

The general characteristics of judgment, together with a résumé of experimental work on the applied Psychology of Judgment, will be found in the following references:

- Hollingworth, H. L., "Judging Human Character." *D. Appleton & Co.*
Hollingworth, H. L., "Vocational Psychology." *D. Appleton & Co.*

Practical suggestions on methods of getting information via questions may be obtained from chapters in the following:

Link, H. C., "Employment Psychology."

The following are references to experimental studies of the matters referred to in this paper, and may serve as samples of the technique employed in such work:

Poffenberger and Vartanian, "Letters of Application in Vocational Selection." *Journal of Applied Psychology*, 1922, 6, 74-80.

Wells, F. L., "Analysis of a Successful Agent." *Life Assoc. News*, Vol. 11, No. 3.

Job Analysis for Employment Purposes

By FRANKLYN MEINE

WHAT is the nature of job analysis work? How does psychological training aid in making a job analysis? These two questions are the task of the present paper.

At the outset we mark off our field for discussion by pointing out that there are *different kinds* of job analysis and that this paper discusses only *one* kind of job analysis: job analysis for employment purposes.

Whether a job analysis is of one kind or another depends upon the *primary purpose* for which that analysis is made. Purpose is all-important because it determines the kind of information sought and the kind of technique or method used to get that information. For one purpose one method of job analysis is used and one kind of information is selected, for a different purpose still another technique and another group of facts; and the two methods of analysis and the two groups of data are so different as to constitute different subjects for discussion. Yet there is considerable confusion of these different kinds of job analyses both in the thinking and practice of psychologists and employment executives. This confusion leads to so fundamental a misunderstanding of the analysis of jobs for employment purposes that it is necessary to consider first what the different kinds of job analyses are and how they are related.

KINDS OF JOB ANALYSES

We may say that there are four main kinds of job analyses, depending upon the purpose or purposes for which the analysis is made:

- I. Job analysis for the purpose of improving *working methods and processes*
- II. Job analysis for the purpose of protecting the *health and safety* of the worker
- III. Job analysis for the purpose of *training* employees
- IV. Job analysis for the purposes of *employment*, including in the meaning of this term:
 - (1) Selecting and placing new employees, transferring and promoting old employees; and
 - (2) Establishing "fair" wages schedule for numbers of employees in different occupations.

The last kind of job analysis (IV) is the kind with which this paper has to do. But before proceeding to the details of this discussion it is necessary first to say something about these other kinds of analyses and purposes, as well as the way in which they are grouped.

To some extent this grouping of purposes and classification of kinds of analyses is arbitrary for the convenience of our present discussion; yet, writers on the subject and workers in the field have in the main adhered to it and have found it helpful in practice. Each of these main groups of purposes can be broken up into several sub-purposes and these enumerated in a long list; but the significant thing is that as within the group there is no essential difference as to the method of analysis used. As between groups there is an essential difference in the kind of information sought and the method of analysis used. This significant differ-

ence is the basis for this classification of purposes.

A person making a job analysis does not ordinarily attempt to make it satisfy all purposes. For one individual to do so would require considerable time and variety of training. In practice what usually happens is that the job analyst makes his analysis with his primary purpose in mind. This does not preclude him from making useful observations and helpful suggestions to other analysts in the organization who are interested primarily in other aspects of the job.

The time and motion study man is primarily interested in analyzing jobs for the purpose of improving working methods and processes. This kind of analysis has been thoroughly described in the well-known books of Gilbreth, Merrick and Lichtner.¹ For this purpose, the question to be answered by the analysis is, what is the most efficient way of doing this particular job? The answer involves in part a statement in quantitative terms of standard performance for that job. A performance standard states how much work in a particular job the employe is expected to do and the way in which to do it.

The analysis of jobs for employment purposes does not involve either necessarily or essentially the establishment of performance standards. The employment analyst seeks to establish quite a different kind of standard—a standard of requirements. The requirements standard states how much certain qualities are desired (or defects permissible) to do the work. This statement of requirements is a part of the employment analyst's description which may, in addition, make use of the information furnished by the performance standard.

The medical and safety departments

¹ "Motion Study," "Time Studies," and "Time Study and Job Analysis," respectively.

make their analyses primarily to determine the safest and healthiest working conditions for any given job. The information obtained from this analysis is frequently significant for other analysts, both for the time study man and the employment analyst.² A performance standard usually assumes a certain set of health and safety conditions, and the more accurately the physical requirements for the job are ascertained, the more accurate will be the employment analysis. The same information is useful in more ways than one.

Analyzing jobs for training purposes raises the question, what is the most effective way of organizing this job content for training an employe in this job? The analyst here usually looks to rearranging the job content in order to teach it to the beginner, presenting at first the less difficult and proceeding to the more difficult parts of the job. Frequently the analysis and the standard of performance established by the time study suffices for training purposes and the instruction cards, with perhaps some rearrangement of their content, may serve as satisfactory bases for training. Certainly it would seem prerequisite to most effective training to have determined first the most efficient way of doing the job. The training information in turn contributes to the employment analysis by stating specifically the length of time required to train to certain degrees of proficiency and by indicating more accurately the types and shop sources of employes desired for training. This type of analysis and the technique which it involves is well exemplified in

² The expression "employment analyst" is used to indicate the person who analyzes the job for employment purposes. As a matter of business organization, the employment analyst, in this sense, may be under the administrative direction of any department or officer.

the writings of C. R. Allen³ and A. W. Kornhauser.⁴

JOB ANALYSIS FOR EMPLOYMENT PURPOSES

The fourth kind of job analysis deals with employment problems, as has already been indicated. The purpose or purposes for which this kind of analysis is conducted may be put in the form of questions: (1a) What is the nature of this job? What is the process? What are the operations? What does the machine do? What does the employe do? (1b) What qualifications are desired in the worker to do the work satisfactorily? *How much* of these qualities are necessary? What is the relative "value" of worth of this job (from the point of view of wages) as compared with other jobs? What grade of job is it?

Clearly these kinds of job analyses are not mutually exclusive, but overlap since they deal with the same thing—the same job. The various analyses are simply different aspects of the same job—different kinds of information organized for different purposes. In business practice the staff employed to study jobs is variously organized: usually the different analyses are made by individuals representing different departments (Methods, Safety and Medical, Training, Employment, say) but sometimes the complete analysis is made by a central research department.

The important thing to emphasize here, to use the example of the employment analyst, is that he makes his analysis primarily for employment purposes. His analysis may or may not presuppose the existence of previously established scientifically deter-

mined performance standards, or standard instruction cards. *He describes the job as he finds it.* He describes it and selects such information available about the job as is pertinent to his purpose. In so far as he reconstructs the job (making another job out of it), he is serving another purpose—determining the most efficient way of doing the job. In many cases it may be wholly desirable, indeed praiseworthy, that he reconstruct the job, but then it should be recognized that he is using more than one kind of job analysis. Then there is another goal, another purpose, another technique. These things, the changed methods of doing the job, are *by-products* of the main course of the employment study, inescapable it seems in practice and desirable; but they are *by-products* and as such should not be used exclusively to evaluate the desirability or usefulness of the employment analysis.

JOB SPECIFICATIONS

The analysis of the job when made for employment purposes leads to the *job specification*.⁵ The job analysis is essentially the "log" of the analyst's observations and collected information,—detailed, cumbersome, awkward. To make this information more usable, more readily accessible, it is reorganized and the essential data needed in the employment department are recast in the form of the job specification. Job analysis is the study and description of the job, its conditions and requirements; the job specification is the reorganization of the information obtained through job analysis.

The practice of one company lends concreteness to this distinction. On one side of an eight- by eleven-inch sheet it gives the analysis of the job as

⁵ Meine, F. "Job Specifications," Federal Board for Vocational Education, Bulletin No. 45.

³ "The Instructor, the Man and the Job," Lippincott, 1919.

⁴ "A Plan of Apprentice Training," *Journal of Personnel Research*, September, 1922.

Fig. 1
JOB SPECIFICATIONS

1 GENERAL

DEPARTMENT NO. _____ SEC. _____ JOB NAME _____

NUMBER EMPLOYED _____ GRADE A B C SYMBOL _____

JOB DESCRIPTION _____

2 MINIMUM QUALIFICATIONS

☐ MALE ☐ FEMALE ENGLISH ☐ READ ☐ WRITE SCHOOLING ☐ 6 ☐ 8 ☐ 2 ☐ 4 ☐ BLUEPRINTS ☐ SKETCHES

PHYSICAL _____

TRADE EXPERIENCE _____ ADVANTAGEOUS _____

3 NATURE AND CONDITIONS OF WORK

☐ PERMANENT ☐ TEMPORARY ☐ OVERTIME ☐ QUICK ☐ SLOW ☐ DANGEROUS
☐ FLOOR ☐ BENCH ☐ MACHINE ☐ COARSE ☐ FINE ☐ EXACTING
☐ STANDING ☐ SITTING ☐ STOOPING ☐ CLEAN ☐ DIRTY ☐ GREASY
☐ HEAVY ☐ MEDIUM ☐ LIGHT ☐ HOT ☐ MOIST ☐ WET
☐ VARIETY ☐ REPETITIVE ☐ AUTOMATIC ☐ DUST ☐ FUMES ☐ ACIDS

MACHINES _____

PERSONAL TOOLS REQUIRED _____

TIME REQUIRED TO TRAIN A TOTALLY INEXPERIENCED MAN, PHYSICALLY AND MENTALLY CAPABLE, TO DO THIS WORK WITHOUT SUPERVISION OF INSTRUCTOR _____

4 DUTIES AND QUALIFICATIONS

DUTIES

QUALIFICATIONS

WHAT ARE THE OPERATIONS ON THIS JOB? WHAT ELSE DOES HE DO?

WHAT QUALIFICATIONS SHOULD HE HAVE IN ORDER TO DO IT? CONSIDER KNOWLEDGE, PHYSICAL QUALIFICATIONS AS EYESIGHT, HANDS, STRENGTH AND OTHER QUALIFICATIONS AS NEATNESS, PATIENCE, ETC.

5 RATES

☐ D. W. ☐ P. W. ☐ TASK AND BONUS ☐ BASE AND PIECE

STARTING WAGE _____

NEXT ADVANCE _____

MAXIMUM _____ RANGE ON P. W. _____ HOW SOON PUT ON P. W. _____

6 PROMOTION TO _____ FROM _____

7 RELATED JOBS WHAT OTHER JOBS IN THE PLANT USE TO ADVANTAGE EXPERIENCE GAINED IN THIS JOB? _____

8 EXITS WHAT IS THE MOST COMMON REASON WHY WORKERS LEAVE THIS JOB? _____

9 REMARKS _____

DEPT. HEAD	FOREMAN	EMP. DEPT.	DATE
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NOTE: IF YOU THINK AGE, HEIGHT, WEIGHT, NATIONALITY OR ANY OTHER QUALIFICATION, IS ESSENTIAL IN SELECTING A WORKER FOR THIS JOB, INDICATE THAT FACT UNDER REMARKS.

the analyst studied it; on the reverse side the job specifications—the essential information needed for “hiring” reorganized and restated most conveniently for the employment department. The more usual practice, however, has been to use the job specification outline as a basis for making the analysis. This dual use of the job specification form has led frequently to the confusion of the job analysis with the job specification.

The job specification form on p. 25 shows the kind of information ordinarily included in the job specification.

PROCEDURE IN JOB ANALYSIS

What is the procedure for making an analysis which leads to job specifications? How do we go about making such an analysis? Many instructions have been given on how to analyze jobs, but some of the best of these suggestions have been outlined in a report of the Committee on Descriptions of Occupations* of the Industrial Relations Association (1920).

The following suggestions are aimed to help the analyst in his work:

1. *Where to begin.* Begin with one department in your factory which is best known to you and where you are sure of the coöperation of the department head, foremen and other employes you may wish to consult.

2. *Coöperation.* Get together with the foremen and sell them the idea of the job specification. Point out the value to them (a) in having the employment department secure full knowledge of the requirements of every job in their department; (b) in furnishing data upon which to base fair wage scales which pay like amounts for jobs making similar demands.

* Multigraphed by the Chicago Council of the I. R. A. A. Report prepared by Messrs. F. Meine, R. W. Staud and W. D. Stearns, for the committee.

3. *Preliminary classification.* Group roughly and classify all jobs in the department.

(a) List all jobs for which somebody is usually hired.

(b) Decide upon a distinct name for each job. Adopt, whenever clear, names commonly used.

(c) Group together jobs identical or very similar, especially those performed by the same type of employe, or those performed by the same employe on a job consisting of several smaller jobs of similar nature.

(d) Group together jobs of the same general occupational nature, as assembling jobs, machine operating jobs, maintenance jobs, etc., keeping each job distinct. This will facilitate analysis as certain factors will affect all jobs of the same general type.

When it is the intention to use the classification of jobs as a basis for fair wage schedules, further classification is usually necessary. This may be done either before the detailed analysis or after it, depending upon the type of industry and the knowledge already available about the jobs. If done before, it is really a sort of preliminary job analysis for the purpose of classification (*i.e.*, grading); if done afterward, it may be accomplished by sorting the job specifications into groups according to the classifications (grades) decided upon. Before the detailed analysis is made it may be advisable to formulate the general scheme of classification to insure getting all the necessary information.

4. *Outline main points.* Draw up a definite outline or a standard set of points to cover all jobs (as suggested by the form in Fig. 1)

5. *Sources of information.* Observation. Study the job to be written up. Notice what is done and how it is done, the type of employe doing the job, working conditions, and any other factors in the outline. Write up all you know about the job or have learned from your own observation.

6. *Foremen and workers.* Get your foreman to give you as complete a statement as possible on all the points to be covered. Be sure to evaluate his statements and

discriminate between facts and opinion. Talk with assistant foremen and, if time permits, talk with a few of the workers about the job. Whenever possible have some of the workers analyze their own jobs and make specifications for them.

7. *Staff specialists.* Consult the various specialists in the plant so as to get the requirements of the job from their particular angle and viewpoint. Consult the mechanical department on questions of equipment; the rate-setting or methods department for the detailed processes and operations involved, for motions and fatigue, and for standard practices established; the safety man as to hazards of the job; the medical department as to health and physical requirements.

8. *Compare results.* Study over these analyses made by foremen and compare them with your own estimate of the job and its requirements. Check at all times by observation of actual conditions.

9. *Job specification.* Then draw up a job specification which states the facts clearly and completely.

10. Submit the tentative job specification to the foreman for criticism and suggestions, and make any revisions necessary. When finally agreed upon by the foreman and employment department submit to the head of the department or division for final approval.

These "instructions" are intended to serve merely as a guide to the essential steps in the job analysis procedure. The technique for making this kind of job analysis is not finally fixed: it seeks sources of better methods and more refined technique as these instruments become available, and seeks to use these better practises when such refinements are profitable. One such source of aid to the job analyst in bettering his procedure is psychology with its point of view, methods and technique for dealing with concrete human problems, especially with such problems as arise in connection with the determination of human requirements for particular kinds of work.

PSYCHOLOGICAL TRAINING FOR JOB ANALYSIS WORK

We come now to the second question, How does psychological training aid in making a job analysis?

A helpful way to find out what kind of aid and how much aid psychological training can render the job analyst, is to analyze the results of the job analysis work which various trained psychologists have already contributed. If we look critically over the field, we find certain very definite influences of psychological training: points of view, emphasis and methods which are "different," and significantly so for the kind of job analysis we have been discussing. The job analyst, whether novice or expert, will do well to take stock of the various ways in which psychology may possibly help him.

HOW PSYCHOLOGY HELPS

First, is the matter of *emphasis*. Psychological training as applied to job analysis has placed increased emphasis upon those characteristics of the job which are especially significant in handling men. The emphasis is that a simple description of what the employee does, a mere mechanical copy of the job as it is, is inadequate, and that the important things about the job are its conditions, its complexities and its peculiarly human circumstances and requirements. Specifically, mental and physical effort, the disagreeable aspects, the peculiar skill requirements, the automaticity of the work, the opportunity for better pay or a better job—these are examples of the psychologically emphasized job factors.

The writer has felt in his job analysis experience that psychological training aided him most in the emphasis, point of view or "slant" which it gave him in digging out those job factors which make for imperfect adaptation of the

worker in his work and which consequently aroused undesired reactions—the sub-surface trouble-breeding job elements which tend otherwise to be glossed over as unimportant.

Second, *detailed analysis*. Psychologically trained analysts have insisted upon more complete and thoroughgoing analysis—with “microscopic minuteness,” to borrow the expression from a recent article.⁷ Characteristics of the job have been separated from the characteristics of the man for the job. “Just what does he do?” Just what the worker does is more sharply differentiated from what the machine does. Relation to other jobs in the business, promotion plans, provisions for wage increases—these are all items added largely through the psychologists’ insistence upon more detailed analysis.

Third, *specific and concrete* description. The necessity for stating job conditions and requirements in as specific and concrete terms as possible has been vigorously urged from the psychological point of view. Some types of job specifications which give space to recording the presence or absence of such qualities as neatness, accuracy, patience, etc., have been strenuously objected to.

There are several serious objections to this kind of job analysis. To begin with, it is not job analysis at all, but a kind of thinly disseminated character analysis. Anybody can make a tour of inspection, gather a superficial knowledge of a number of jobs, and then describe them in such comprehensive terms as those just enumerated. In the next place, these qualities are so general and vague that they mean very little when tied up with a particular job. Any number of jobs can be equally well described by such words and phrases as industry, patience, accuracy, application,

routine temperament, loyalty, static, and so on. But these words mean little or nothing at all as they stand. They are detached. Patience as such, for instance, is an abstract and meaningless quality. A man may be very patient in one way and very impatient in another. . . . Therefore, it is useless to call for a man of patience unless it is possible to distinguish between different kinds of patience and then specify which kind is desired. The same thing may be said of every one of these general qualities.

Different jobs have very specific and characteristic differences, and it is impossible to describe them except in terms of qualities that are equally specific and concrete. It is quite apparent that the personal qualities of a worker also are not general or abstract, but are particular and very closely tied up with specific characteristics of a particular job.⁸

Fourth, *quantitative statements of job requirements*. To measure certain kinds of these specific qualities required for the job, some psychologists recommend the psychological test. First let us give a compact statement as to the nature of test procedure in job analysis work and then proceed to a fuller explanation.

A psychological test used to measure steadiness of attention say in a particular job, when given to a number of workers in that job, yields a series of numerical scores (say), 97, 113, 201, etc., indicating the degrees of proficiency or steadiness of attention. If employees who score 110 or less in this test are below the desired standard of performance in the job, the score 110 in test X is a quantitative statement of one job requirement. This psychological test method as a part of job analysis procedure has been more fully described by Mr. Link.⁹

In contrast with the method of analyzing and describing jobs in terms of personal

⁷ Kitson, H. D. “Scientific Method in Job Analysis,” *Journal of Political Economy*, June, 1921.

⁸ Link, H. C. “Employment Psychology,” pp. 256-7.

⁹ “Employment Psychology,” pp. 258-9.

qualities, is the psychological method. This method makes a thoroughgoing analysis of one job and then on the basis of this study selects a set of tests which seem to involve the same ability as that required by the job. These tests are then tried out on a large number of workers whose ability is known in order to find those tests which do this to the highest degree. When tests which are sufficiently significant are found, the result is a standard and scientifically accurate measurement of those specific abilities which are required by that specific job. It is unnecessary to name these abilities even. The qualities needed by the successful inspector, for instance, need not be called good visual discrimination, quick reaction time, and steady attention. These names are also general and serve merely as a starting point. The requirements of this job may be stated simply as the ability to reach such and such a standard in tests number two, six and eight. . . . The job has been analyzed in a scientific manner, in such a way that the abilities required by that job can be definitely and mathematically gauged.

To what extent the psychological method of stating job requirements quantitatively in terms of test scores is possible, reliable or profitable, is not within the scope of this paper. The significant thing for the employment analyst is that here is a method which has been used successfully and points in the direction of further helpful refinement in employment job analysis procedure.

Fifth, *quantitative statements of job characteristics*. Another method for obtaining quantitative statements of job requirements other than the psychological test is that of rating job characteristics¹⁰ or the job rating method.¹¹

¹⁰ The term job "characteristics" is used here to include both the conditions of the job and its requirements.

¹¹ For the theory and logic of the method see: Kingsbury, F. A. "Grading the Office Job," *Administration*, March, 1923, p. 271, and fol-

Rating a job consists in having persons who know about the job give their best judgments, with the aid of a previously prepared job rating scale as a basis, of how much skill and information, how much disagreeableness, how much intelligence, or how much anything else characterizes a particular job.

The job rating scale lists the various job factors to be used in rating and indicates the relative importance of each job factor by giving it a "weight" or numerical score (or "points"). Rating then would consist in giving numerical scores or points to each characteristic of the job to be rated. In factory work, for example, such a list of items would include:

<i>Job Factors</i>	<i>Points</i>
(1) Skill and information required in the job.	40
(Five grades scoring respectively 40, 32, 24, 16, 8, depending on the degree of skill and information)	
(2) Mental and physical effort required.	20
(20, 16, 12, 8, 4)	
(3) Disagreeable factors: dirt, oil, wet, heat, cold, etc.	15
(15, 12, 9, 6, 3)	
(4) Peculiar value of the work to the company.	25
(25, 20, 15, 10, 5)	

On the basis of a rating scale used to rate office jobs in a bank,¹² one rather responsible job was rated as below: (See p. 30).

These items when once determined upon can be made as specific and as

lowing; and especially for logical considerations in the rating method, Kornhauser, A. W. "The Psychology of Vocational Selection," *Psychological Bulletin*, April, 1922, p. 288 mo. A. Kingsbury's articles in *Administration*, March-July, are the best recent discussions of job analysis, job specifications, job rating and job grading.

¹² Kingsbury, *ibid.*, p. 270.

<i>Job Factors</i>	<i>Range of Points</i>	<i>Points for this Job</i>
Grade of duties.....	1 to 3	1
Executive responsibility.....	0 to 6	2
Responsibility for money or negotiable securities.....	0 to 4	4
Personal contacts with public	0 or 1	1
Sex.....	0 or 1	1
Minimum age.....	1 to 10	6
Minimum general education..	1 to 5	3
Special training courses.....	0 to 6	3
Experience.....	0 to 7	3
Personal qualities essential...	0 to 8	6
General intelligence.....	1 to 5	4

carefully defined as desired. For example, the items as listed in the foregoing scale were each specifically defined, as in the case of "Responsibility for money or negotiable instruments" and weights or points assigned accordingly.

Weight 0. No responsibility for care of money or readily negotiable instruments involved.

Weight 1. Responsibility involved for improper withdrawal of balances.

Weight 2. (a) Full responsibility in person for small amounts. (b) Responsibility under check or supervision, but indirectly, *i.e.*, through assistants, for large amounts.

Weight 3. Responsibility in person, under check or supervision, for large amounts.

Weight 4. Full responsibility in person for large amounts.

The other factors in the scale were likewise defined and only those weights or points given for a job when the characteristic fitted the definition. So, too, the industrial job rating scale can be made more specific,—item 1, for example, skill and information can be broken up and made as detailed as needed. The more specific and concrete the definitions on the scale, the better the ratings.

Different methods of rating jobs may of course be employed to obtain

the job ratings. Each job may be rated directly on the basis of the rating scale definitions. Another method consists in making a "master-scale," after the fashion of the Army Personnel scale, and then in job-to-job comparisons of all jobs to be rated with those selected as standards on the master job scale. Still another method is to rate all jobs for one characteristic on the scale at one time, using both definitions and concrete job comparisons to decide the relative position of each job, as compared with all other jobs, with reference to that one characteristic. The latter method has this advantage that better ratings of particular job characteristics are obtained by comparing the ratings of this characteristic in a number of jobs.

JOB RATING AND JOB GRADING

Comparing one job with another may suggest that the writer has in mind job *grading*. This is not the case. Job rating and job grading are distinctly different processes, and it is important for the present discussion that they be not confused. Job rating gives quantitative estimates of job conditions and requirements; job grading is the determination of relative values of jobs for determining relative wage rates, promotion levels, etc. The data obtained by rating jobs may be evaluated for the purpose for which the grading is conducted by assigning different weights. The difference lies between *How much?* and *How important is it for this particular purpose?* For the job specification the job rating tells merely how much skill; for establishing fair wage schedules this amount of skill is evaluated to estimate how important it is in determining how much pay. Most of the job grading work so far has been done primarily

for the purpose of establishing wage schedules.¹³

The job rating scale may frankly be admitted to be essentially a systematization and organization of the opinions of the department managers and chief clerks. In judging whether a job is "high-grade" or "low-grade," and how it ranks in comparison with other jobs, the executive has implicit in the background of his thinking certain standards which he rarely if ever takes time to formulate explicitly, even to himself. The scale represents an effort to discover these standards and to give them formal quantitative expression.

To admit that this scale is an "organization of opinions" is perhaps to condemn it in the eyes of certain devotees of objective mental measurements, who may label it, as rating scales are often labeled, as "subjective" and "unverifiable." But to reject personal opinions as a valid source of scientific knowledge is dogmatically to deny the value of that which, after all, is the basis for nine tenths of our daily decisions, including those on the most crucial issues

of life. The opinions of executives who have had long and varied experience in supervising these kinds of work and who have ability above the average—opinions which are, furthermore, being daily subjected to colleagues' criticisms and to practical test in the will of the day's routine—cannot reasonably be dismissed in summary fashion.¹⁴

In the past, the usual job specification practice has not been to give quantitative statements of the different job elements, but such statements are needed if the job specification is to realize much of its usefulness. The job ratings express merely in a much desired quantitative form how much each of these elements a particular job possesses. How much skill is required? How much automaticity? How much physical effort? Mental effort? How much executive ability? To these questions the job rating gives the quantitative answers.

The process of job rating is of especial aid to the employment analyst. It throws his analysis and specifications at once back into shop experience for evaluation; one job is compared with other jobs, and out of these comparisons come more accurate and more useful job specifications.

¹³ Kingsbury, *ibid.*; Becvar, F. J., "A Method of Grading and Valuing Operations," *The Annals*, Wage Determination number, 1922; Young, A. H., "The Occupational Rating Plan of the International Harvester Company," *Management Engineering*, May, 1923; Stearns, W. D., "Standardized Occupations and Rates," *Industrial Management*, May, 1918, and Bills, M. A., "Job Classification and Personnel Rating," *Journal of Personnel Research*, Dec.-Jan., 1922-23.

¹⁴ Kingsbury, F. A. "Grading the Office Job," *Administration*, March, 1923. Adapted.

Psychological Tests in Industry

By HENRY C. LINK

THE use of psychological tests in industry is most conspicuous because it is so rare. Indeed, the extent to which such tests are actually applied seems to bear an inverse ratio to the quantity of interest and publicity which they have in recent years received. Even after five years of intensive and extensive discussion, a convention meeting on the subject of tests will usually draw a much larger attendance than will a competing session devoted to some equally important topic. But when one attempts to discover what those interested in tests are actually doing with them in their own industries, the customary reply is: "We are considering the use of tests but our organization is not quite ripe for their introduction now." Or: "We believe in tests but as yet are unable to see just how to apply them to our particular situation." Even in the comparatively infrequent cases where companies claim to be using psychological tests, a first-hand investigation often reveals the fact that they are using the "words," but have little or no conception of the "tune."

The investigations in which the writer has taken part (cf. Reports of American Management Association on Psychological Tests for 1919 and 1920) and his independent observations since have revealed the utmost confusion of thought and practice in regard to psychological tests of the various kinds. The situation is such that no simple questionnaire, sent to various companies, would furnish information which could be used to gauge reliably the extent to which tests are being applied both scien-

tifically and practically. Only a first-hand investigation by a competent observer could produce this desirable information.

The confusion and lack of understanding referred to cannot be attributed to industrial executives so much as to the circumstances under which psychological tests were originally developed. Some psychologists were primarily interested in the development and application of intelligence tests, an activity which was crystallized during the war in the form of a Psychological Section, dealing entirely with intelligence tests. Another group of psychologists devoted itself to the development of trade tests, building up a technique and a theory which, both during the war and subsequently, have been considered apart. Certain psychologists have concerned themselves with particular tests for mental alertness, others with special ability tests, still others with occupational tests, some with capacity or aptitude tests, manual dexterity tests, educational tests, etc., etc. These circumstances, natural enough in a new field, have resulted in a heterogeneous terminology and in conflicting theories among psychologists themselves. For example, it is frequently claimed that a trade test is not a psychological test and that a special ability test is not a trade test. Such statements cannot help but confuse the thinking about tests and dissipate the energies of those who advocate their use. Indeed, we are today not unlike the builders of the Tower of Babel, hindered in our efforts by many discordant tongues.

WHAT ARE PSYCHOLOGICAL TESTS?

Before discussing the uses of tests in industries, therefore, it may be profitable to define our terms. A moment's consideration will show how superficial are the distinctions implied by the different test names in use. Mental alertness tests, for instance, have been devised as specific tests for mental agility. However, all tests, whether trade tests or what not, are tests of mental alertness. Whether they test what a man has learned from a book or from handling the tools of a trade, they test his mental alertness. Similarly, there are no tests which can claim for their exclusive use the term *educational tests*; for all tests are educational tests in the sense that they measure the results of a man's education or—what amounts to practically the same thing—the results of his previous experience. There is no fundamental difference between trade tests and special ability tests. A trade requires a certain kind of special ability and any tests used to measure this ability may be called a trade or occupational or a special ability test. As for general intelligence tests, they are really a collection of different tests of various specific abilities. The term, intelligence tests, represents a gratuitous assumption of the fact that these tests measure general intelligence. This fact has never been proved. All that we can say is that intelligence tests, like the other tests mentioned, are tests of certain mental abilities, and that their practical value for specific purposes must be established exactly as we establish the value of any other test.

Our language and ideas will be considerably clarified if we think of all tests simply as tests of mental ability. Each test is a test of the mental ability required in the performance of that

test. The fact that some tests require the use of a pencil while others entail the use of mechanical tools or manual devices does not alter this fundamental truth. Because different individuals, interested in different aspects of testing, happened to choose specific names for their tests should not blind us to the fundamental sameness between these tests.

But though all these tests may be considered tests of mental ability, they are not *necessarily* psychological tests. In answer to a question as to whether his company used psychological tests a certain employment manager said: "No, we use only common-sense tests." There seems to be a widespread impression that psychological tests are freakish, complicated affairs, quite opposed to the plain and direct methods of common sense. As a matter of fact, psychological tests are nothing more than common-sense tests *refined*. When a department head dictates a letter to an applicant for stenographic work, he is giving her a common-sense trade or occupational or educational test. When a tool maker is put to work on trial, he is being given a common-sense test of his ability. The difficulty with common-sense tests is that common sense is so variable in its judgments. In testing a stenographer, one man gives a letter and marks it in his way, another gives a different letter and marks it in a different way. Even the same man may vary his procedure with different applicants. A psychologist, instead of using any letter and marking it in any way, first experiments with a number of different letters and with a considerable number of stenographers. From this process, he derives a dictation and transcribing test which is as brief as possible and a method of giving the test and marking the results which will insure a standard or uniform measurement of all applicants. The

uninitiated, observing the process of giving a psychological test in dictation and transcribing, would think of it merely as a common-sense test and would probably fail to appreciate the refinements which make it, in addition, a psychological and scientific test. So with other tests. Any test of mental ability, whether a trade test, educational test, intelligence test, or whatnot, may be given as simply a common-sense test. When, however, any of these tests has been worked out in accordance with the experimental technique which characterizes psychology, it becomes a psychological test. From this, the absurdity of the statement that a trade test is not a psychological test should be obvious. A trade test, like any other test, *may or may not* be a psychological test, depending upon whether it is used in its crude or refined state.

The chief difference between common-sense tests and psychological tests, then, is the difference between common-sense tests and scientific tests in any field. A man with a thick skin and one with a thin skin, sitting in the same room, do not have to rely upon their common-sense to determine whether a room is hot or cold. They may decide by referring to a thermometer.

But though a thermometer is a quick and uniform test of temperature conditions, it will not tell the occupants of a room infallibly whether a window should be closed or opened. Neither will a brief and standardized test of mental ability tell an employer whether an applicant should be hired or rejected. The practical inferences which may be drawn from psychological tests of mental abilities can be determined only by careful studies of the results from such tests in relation to the abilities displayed by people actually on the job.

EXAMPLES OF TESTS IN INDUSTRY

The conditions underlying the practical application of psychological tests may be better described by reference to certain concrete examples of tests used in industries.

One of the first, if not the first company, actually to use tests in the selection of factory workers, was the Joseph & Feiss Company. After having used tests for five or six years, this company made a further study of its test procedure and tried out certain additional tests. Some extremely interesting facts were discovered.¹ Certain textile operators whose work required manual skill and dexterity were being selected partly on the basis of a test presumed to measure their muscular coördination and mechanical skill. The test consisted of a steel frame in which were three holes. Through each of these holes in turn the applicant was required to plunge and withdraw a short rod as rapidly as possible, continuing the process for a given length of time. A Veeder counter behind each hole registered every thrust and the total number of thrusts in the time specified constituted the applicant's record.

Since the work of the operators employed was on a piece-rate basis, their exact productive efficiency was known. The productive efficiency of three hundred trained operators, selected at random, was compared with their ability in this test in accordance with a statistical method of correlation familiar to any competent statistician. The correlation or correspondence was .002, which is practically nothing. Beyond its usefulness as a rough means for detecting left-handedness,

¹ See "Experiment and Statistics in the Selection of Employees," Harry A. Wembridge, *American Statistical Association Quarterly*, March, 1923.

"there seemed to be no value to the test for selection since there proved to be no relationship between success in the test and productive capacity. Apparently the test measured a past or already acquired habit of quick, dexterous movement rather than an ability to learn such movements. As a matter of fact, the learning of such movements was fairly rapid, so that even though an operative had not been dexterous previously he often could readily become so, and therefore the equipment of dexterity and rapid movement which he brought with him was negligible in the long run."

We have here an ideal example of sound psychological procedure. A test which, it had been assumed, measured the ability generally termed manual dexterity, when studied in accordance with established psychological methods, was found of no value in the selection of the operators in question. It appears that the study in this case was made by a competent statistician rather than by a psychologist, but this makes little difference, since the proper procedure was used. The trained psychologist must be something of a statistician and, on the other hand, a competent statistician possesses one of the most important assets in determining the value of psychological tests. Instead of being unduly influenced by the dramatic power of isolated instances, his technique enables him to weigh these instances against the general tendency shown by a large number of cases. In the example cited above, there may well have been twenty-five cases of striking agreement between productive efficiency and success in the test, but the agreement for 300 individuals as worked out statistically was .002. This means that the instances of agreement and those of disagreement practically nullified each other.

Many companies carry on careful statistical work to check up their past

business experience and to estimate future requirements. It is surprising, therefore, to find how frequently such companies delegate the study of tests and other methods of selection to individuals who are not well grounded in statistical methods. Such companies are inviting an expensive ritual in place of a scientific demonstration of facts.

In contrast to the results of the study described above, are the results obtained at the Eastman Kodak Company.² An attempt was made to find tests of value in the selection of operators in the film-finishing department. These operators worked on a piece-rate basis and therefore it was possible to obtain an objective estimate of their productive efficiency. According to the job analysis made, the work of these girls required:

- Manipulating skill and speed in fingers
- Speed in forearm movements
- Frequent movements at full arm length
- Accurate and rapid discernment
- Quick response
- Alertness in comprehension
- Memory for details
- Steady and prolonged application

A special board with holes in which to place small metal pins was used. To give the words of the report:

"At the left side of the board are two sections, A and B, each consisting of a rectangle made by drilling one hundred and twenty holes (twelve rows of ten holes each). Running from top to bottom of the board at the right of these sections are two rows of twenty-five holes each. These rows are called Sections C and D. At the right side of the board is Section E, consisting of one hundred and seventy holes (seventeen rows of ten holes each), the holes being numbered consecutively from one to one hundred and seventy.

² See "The Placement of Operators Through Tests," Arthur L. Mann, *Personnel Administration*, June, 1922.

"At first we devised about thirty separate tests designed to measure those qualities in the operator which were necessary on the job. We then selected ten of the highest grade operators, ten average operators and ten poor operators, whose records were available. Each of these operators was given the whole series of tests. When the results were tabulated we found that there were just ten of these which accurately rated the operators. The other twenty sets were accordingly dropped. Several other groups of operators of known standing were given these ten tests with very satisfactory results. In no case did a poor operator make a high rating, nor did a high grade operator receive an unsatisfactory rating.

"To simplify the use of test ratings, the ten individual tests were combined into three groups. Test numbers one, two and three which measure finger speed were used to obtain the dexterity rating. Tests four and five which measure ambidexterity and mental control of hand or finger movements were used to obtain the proficiency rating. Tests six, seven, eight, nine and ten measure the mental alertness of the operator. Test number six measures hand and eye coördination, test number seven measures hand and ear coördination, test number eight is primarily a memory test, test number nine measures alertness of comprehension and ability to follow directions and test number ten is indicative of accuracy."

TESTING THE VALUE OF TESTS

From the above, it is not clear whether the ten different tests selected were entirely different or were simply variations in the use of the form board described. The latter is assumed to have been the case. If so, these tests, while requiring a certain manual dexterity, were far more complicated than the three-hole test used at the Joseph & Feiss Company. The operators tested were working on a piece-rate basis and therefore an objective record of their productive efficiency was at hand. However, nothing is said in

the account of the study of the statistical correlations obtained between success in the tests and the efficiency of operators doing exactly the same kind of work. This is a vital omission, for without these facts before us, it is impossible to pass an opinion on the validity of the claims which are made. The many individual instances of agreement enumerated in the report of the experiment do not compensate for this omission. The account given of the method of setting minimum standards for the different tests, however, to some extent confirms the claims which are made. But the grouping of the ten tests into tests of dexterity, proficiency and mental alertness adds little since, obviously, each of the ten tests is a test of dexterity, proficiency and mental alertness combined. The success of an operator at her work is judged by a net result, namely her piece-work record. Since we cannot divide this net result quantitatively among the various causes or mental qualities of the operator who produced it, we cannot associate particular tests with particular mental qualities. All that can be said, properly, about any test is that success or failure in its performance coincides with success or failure on the job. This, after all, is the important question about any test from a practical point of view.

One of the oldest and most widely accepted proofs of the validity of tests in factory work is the experiment with bicycle ball-bearing inspectors given in F. W. Taylor's book, *The Principles of Scientific Management*. It has remained for an English psychologist, B. Muscio, to bring out the real facts in connection with this widely quoted experiment. The account given by Taylor states that a reaction time test, not definitely described, was used to select 35 girls who

did more work in a given time than 120 unselected girls had previously accomplished. The increased average output per individual of about 340 per cent is attributed chiefly to the selection made possible by the test. Muscio, by comparing different accounts of this experiment,³ shows that the test given consisted of timing the actual work of the inspectors with a stop watch and eliminating all those who fell below a certain point. Also, the girls were put on a piece-work basis and paid a piece-work wage. In short, no test by which new workers could be selected was used and the improvement made was due entirely to the well-known method of changing a poorly supervised day work job into a closely supervised piece-work operation. Thus, as Muscio makes clear, this experiment is an excellent demonstration of the value of more scientific production methods but a very misleading statement of the value of psychological tests for selecting new employees.

The writer may be allowed to digress for a moment to express the opinion that time study or the stop-watch method of timing the elements of human behavior in performing work is closely akin to the psychological technique. An even closer approximation of the psychological ideal are the motion study methods devised by the Gilbreths; for while the stop-watch method times the elements of human behavior, the Gilbreth method registers not only the time elements but the *how* elements of working behavior as well. In other words, it provides an objective record which has *qualitative*

³ See B. Muscio's "A Review of the Literature of Vocational Guidance," Report No. 12 of the *Industrial Fatigue Research Board*, published by His Majesty's Stationery Office, London. This is, in my opinion, by far the best critical survey of employment tests available. It is concerned largely with tests applied in the United States.

as well as *quantitative* significance and makes possible not only the selection of the best workers in a group, but of the best working methods among those workers.

Psychologists in this country have given practically no attention to this phase of industrial psychology, but have confined themselves almost exclusively to tests for selecting new employees. English and European psychologists, on the other hand, have given almost equal attention to the motion study aspect and in this respect the work of the Gilbreths has been most frequently taken as a model.

It will be interesting to see, as time goes on, which of these two possible phases of psychological study will make the greater contribution to industry.

APTITUDE TESTS FOR APPRENTICES

Returning to tests for the selection of new employees, an interesting study has recently been made at the Scoville Manufacturing Company. This company maintains an apprentice school for tool makers and machinists, and the object of the study was to find a more satisfactory method of selecting the boys to whom this expensive training should be given. This study came under the first-hand observation of the writer and followed closely the procedure of an experiment at the Winchester Company already described (*Employment Psychology*, ch. 11).

Three tests were chosen. The first consisted of a three-inch cube, painted black on the outside and then cut up into 27 one-inch cubes. The 27 small cubes were scattered on a table and the apprentice was asked to put them together into one three-inch cube which, like the original, was entirely black with no natural wood surface exposed.

The second test consisted of two form boards, each holding the same

blocks cut in two different arrangements (see line drawing below). The blocks were dumped out of one board on a flat surface. The boy was then asked to place these blocks into their proper space in the second form board. They were then turned out of the second board and the boy was requested to fit them into the first board. It will be seen that this method insures every boy's having the blocks placed

members of the apprentice school and the results were then compared with the ability shown by the boys in their apprentice work. Their relative ability was graded, in this case, by the combined personal opinions of the apprentice shop foreman, assistant foreman and instructors. The results, without any statistical comparison, showed that the four boys who were considered failures in the school ranked



A DOUBLE FORM BOARD TEST WHICH INSURES UNIFORM PROCEDURE

before him in exactly the same arrangement, a fact not characteristic of other tests of this nature.

The third test was the well-known Stenquist mechanical test, a box with ten compartments each of which contains the unassembled parts of a simple mechanical device such as a cupboard latch, a clothes-clip, an endless chain, a magazine clip, a doorbell, a bicycle bell, etc. The boy was asked to assemble these parts into their proper objects.

These three tests were given to 25

at the bottom of the list in the tests. Conspicuous was one boy to whom, because of his extremely awkward and dull appearance, admission to the school had long been denied. Finally admitted, because of his persistence, he quickly revealed himself as one of the most promising boys in the school. In the tests he stood near the top, and had they been given at the time of his application, he would probably have been admitted without delay.

The writer, having access to the data of this experiment, made a sta-

tistical computation of its results. It was found that there was a correlation between the ability of the boys in the tests and their ability as apprentices, as follows:

Correlation between ability in work and ability in Cube test.....	.33
Correlation between ability in work and ability in Stenquist test.....	.36
Correlation between ability in work and ability in Form board test.....	.40

To be sure, this is not a very high degree of agreement, but it is significant, especially in view of the similar correlations with the same tests found by the writer in the earlier experiment mentioned above. Also, it should be remembered that the ability of the boys as apprentices could not in this case be judged by their production records. The work of tool makers and machinists is not uniform and repetitive as is the work of piece-rate operators. Consequently, ability can be judged only by the rough, personal estimates of the foreman and his assistants. In so far as the personal equation here involved detracts from the accuracy of the estimates of the relative ability of the boys as apprentices, it naturally decreases the possibility of accurately determining the real value of any tests.

With these limitations in mind, it still seems as though the tests described have a certain value in selecting boys and young men for machine-tool and machine-work apprenticeship. This type of training is carried on extensively throughout the country, and permits of many costly mistakes in selection. It is surprising, therefore, to find how few companies in the metal trades industry have taken the trouble to try out these or similar tests in the conduct of their apprentice schools.

TESTS OF ACQUIRED PROFICIENCY

The examples of tests described above clearly represent an attempt

to provide a means of ascertaining whether applicants have the necessary capacity or mental ability for *acquiring* proficiency at a given task. The critical question about a new apprentice is: Has he the capacity to learn the trade? The critical question about an applicant for a job such as tool maker, sheet-metal worker, printer, stenographer, bookkeeper, is: Has he learned his trade or occupation and how well?

Certain tests have been devised to ascertain how well an individual has mastered the details of an occupation in which he claims proficiency. The nature of these tests naturally varies with the nature of the occupation. Tests in dictation and transcribing for stenographers have already been discussed. The army trade tests are a conspicuous example of measures specifically adapted to test the special abilities required in certain trades. Generally, these tests consist of a series of oral questions about the trade, another series of questions based upon photographs of tools or operations peculiar to the trade, and a few sample tasks characteristic of the trade, which the applicant is asked to perform.

These tests, like other tests, can be made up and given merely as common-sense tests, but the army trade tests were worked out and standardized according to the careful experimental process characteristic of the psychological method. The practical value of trade tests in the selection of men for trades in specific industries, however, must be determined in the same way in which the value of all other tests is determined, that is, by actual trial and by working out statistical correlations between trade ability and ability in the tests. Potentially, the army trade tests have considerable value, but the writer knows of no company which has

adapted these tests to its use in accordance with the proper statistical procedure.

Among European countries, Germany stands out conspicuously in the application of tests to discover ability in certain trades. The emphasis, however, has been almost exclusively on tests for detecting inherent capacities to learn a trade. Elaborate mechanical tests have been devised for measuring steadiness of the hand or freedom from tremor, accuracy in gauging distances, sensitivity of touch, spatial perception, etc. Dozens of companies are using such tests in the selection of their apprentices and the movement has a tremendous following with considerable governmental support.

A conspicuous weakness exists in the practice of the Germans as the writer knows from their literature and from his continental correspondents. The Germans have taken most of their tests on faith and have not demonstrated their practical value by means of statistical comparisons or correlations. The value of their elaborate and complicated testing machinery is therefore highly problematical.

DIFFICULTIES IN PROVING TESTS

Probably the greatest limitation in the application of psychological tests to selection is the great difficulty of proving their practical value in a way which will stand criticism. It is difficult enough to establish a proof when experimenting with employes all of whom are doing exactly the same kind of work on a piece-rate basis. Even though in such cases we have actual production and quality records to determine the relative proficiency of the workers, there are many factors such as length of service, flow of work, etc., which make it impossible to regard the production records of individuals

as absolute measures of their relative ability in a group.

When we come to employes whose work is different, so that their production records cannot actually be compared with one another, and above all, when experimenting with employes whose production cannot be measured even individually, the proof of a test's value rests on pretty uncertain ground. The only basis which can then be used are the personal opinions of the foremen or departmental heads as to their workers' relative ability, and these opinions themselves have no value which can be scientifically demonstrated. If the value of a foreman's opinions about the relative ability of his men could be proved by reference to the actual productivity of his men, then his opinions would be superfluous, for we could use the production records in the first place.

This difficulty is a fundamental one and greatly limits the field in which tests can be applied with any degree of scientific confidence.

When it comes to the selection of industrial executives or candidates for executive training courses, all existing difficulties are accentuated. It is impossible, so far as we know now, to prove the value of psychological tests for this purpose. Tests can be given to measure acquired knowledge, for example, the knowledge of problems and their solution in a given type of engineering, etc. But to measure the probability of a person's success in an executive position is quite another matter. In the first place, there is no fixed standard by which the degree of an executive's success can be determined. One manager may increase a company's business by 25 per cent in one year, another manager by 12½ per cent another year, yet who would assert that this simple fact proved the first manager twice as good as the second?

Moreover, different executives are engaged in different activities under different conditions, so that their success cannot be compared. How can the relative ability of the production managers in twenty-five different companies be determined? Or how can the different executives and departmental heads in one company be arranged in the order of their ability? Any attempts to make such estimates must necessarily be on the basis of personal opinion, and personal opinions or ratings at best are of little value as a basis for proving the validity of psychological tests.

GENERAL INTELLIGENCE TESTS

The assumption has been made and accepted with widespread credulity, that an increasing quantity of general intelligence becomes necessary as we go up the ladder of occupational or industrial success. The army intelligence tests, some results of which are shown in the accompanying diagram, seem to prove that this is so. It will be seen that laborers show the lowest level of general intelligence as measured by these tests and that engineers, army chaplains, medical officers and Y. M. C. A. secretaries represent the highest levels. But if on this diagram, we take the right-hand half of the black bars representing stenographers, typists, and accountants, we find them as high in the intelligence tests as a large proportion of civil engineers, medical officers and Y. M. C. A. secretaries. The highest are just as intelligent as a fair proportion of the army chaplains and engineering officers. The intelligence of many band musicians, we see, is just as high as the intelligence rating of many members of the ensuing groups on the diagram higher up in the occupational scale.

A vertical line run from the right-

hand end of the black bar representing cobblers, down through the other bars, will run through 58 ensuing black bars, ending with mechanical engineers, thus showing that the most intelligent cobbler makes as high a mark in the intelligence tests as a considerable number of the members of 58 presumably higher occupations. Now, when it is noted from the chart legend that each black bar represents only the middle 50 per cent of all those in a given occupation tested, and that 25 per cent of each occupational group is omitted on each end of the black bar, another conclusion follows, namely: that 25 per cent of all the cobblers tested rank as high in intelligence as 25 per cent or more of all the members in 58 occupations higher up in the occupational scale.

In other words, the intelligence levels of different occupations overlap each other so much and embrace such a wide range of intelligence in each case that we cannot use intelligence as a criterion of success at a particular job. All that we can say about an individual is that, on the basis of his intelligence score, he is qualified for a large number of occupations, ranging, it may be, from cobbler to mechanical engineer. Conversely, we cannot say that a man's general intelligence fits him for any particular occupation.

Now, whether a certain level or degree of general intelligence is indispensable to success in a particular occupation, and what that level is, must be proven in exactly the same way as we prove the value of any other psychological test. That is, an actual correlation must be statistically established between degrees of success among employes in a certain occupation and degrees of intelligence as registered by the particular test of general intelligence which is being tried out.



FIGURE 16. OCCUPATIONAL INTELLIGENCE STANDARDS

Bar shows range of middle 50 per cent. The vertical cross bar shows position of median. The figure is based on data for approximately 36,500 men. Numbers at extreme left are key numbers of occupations. Data taken from soldiers' Qualification Cards.

Such studies have been made with varying results. Professor Starch reports certain correlations between degrees of intelligence and the success of waiters. The Eastman Kodak Company reports (see above reference) that, "Very early in the game we found that a written test proves too much of a handicap to many good workers." The Joseph & Feiss Company's experiment included an intelligence test given to 290 employes resulting in the high correlation of .52. However, this general intelligence test was especially devised to meet the specific requirements of the situation. A general intelligence test was also tried with some of the apprentices at the Scoville Manufacturing Company but the results, in so far as they could be computed, showed no significant correlation. Arthur Otis reports that he found no correlation between intelligence and the success of some 400 mill operatives (*Journal of Applied Psychology*, December 1920).

Other instances could be given, but they would only confirm the statement that the practical value of any intelligence test must be specifically established, for specific occupations, under specific conditions, just as the selective value of any other psychological test is established. The personal opinions sometimes expressed by members of companies which have used intelligence tests, as to their value, have weight only as personal opinions.

In the discussion thus far, the measurement of moral qualities or the elements of character has not been touched upon. We have confined ourselves exclusively to the testing of mental abilities. Obviously, the success of an employe in a given position depends not only upon his mental capacity, but upon his will power, industry, patience, honesty, tact, disposition and numberless other qualities

as well. Psychologists have made attempts to measure such qualities, but thus far without practical success. The writer knows of no instance in which the attempt to measure the qualities of character by themselves has been successful as applied to employment in any particular company.

THE FUTURE FOR TESTS IN INDUSTRY

If this discussion of tests has seemed rather technical, it is only because the successful application of psychological tests is impossible unless these technical details are taken into account. If the writer's presentation has seemed somewhat sceptical and destructive, it is because of his belief that the ultimate success of tests depends upon an honest appreciation of the limitations and obstacles which exist.

The statement was made at the outset that psychological tests are only common-sense tests, refined according to the procedure which characterizes psychology. The further application of such tests must come through the close coöperation of practical-minded industrial executives with individuals technically equipped in the psychological method. Before this coöperation can take place to best advantage certain preliminary conditions must first be fulfilled. The fulfillment of these conditions can come only from the common-sense activities of industrial executives in improving the present methods of employment by common-sense means. Among these improvements may be mentioned:

- (1) Adequate employment records;
- (2) The development and maintenance of actual production records for individual employes;
- (3) Better common-sense methods of employment including adequate job-specifications, specific questions for specific jobs, and common-sense tests

of an applicant's previous preparation;

(4) A more systematic follow-up of new employes;

(5) More intensive training of new

employes whether in groups or as individuals.

When common sense has done its part, then the refinements of a scientific method can produce further fruitful results.

Tests for Trade Proficiency

By J. CROSBY CHAPMAN

THE Trade Test is an instrument devised during the war to meet the problem of correct placement of the trade personnel of the army. The purpose of this article is to describe¹ the procedures used in its construction and to point out their applicability to the wider industrial situation.

While the term trade test would mean literally any form of examination the object of which is to measure trade proficiency, owing to recent practice it has been confined to certain types of tests which are to be described. It should be carefully distinguished from prognostic tests, or tests for aptitudes, the aim of which is to predict the rate at which a trade can be learned. Essentially, the trade test is a measuring device which can be used *without trade knowledge on the part of the examiner*, for rating in objective, quantitative terms the degree of trade ability possessed by the person under examination.

In many scientific fields we are familiar with the use of accurate measuring devices, but the idea of measuring such a human trait as trade ability by an objective scale is of such recent date that it calls for some discussion. We have become so accustomed to such phrases as excellent workmen, good workmen, average workmen, poor workmen, that we are tempted to believe that the terms, "good," "average," "poor," stand for something quite definite in the sense that ten pounds, six pounds, and four pounds

stand for definite amounts of weight. When we analyze the meaning of these terms we find that the designation "good," used by different individuals may mean very different degrees of trade ability; that is, the judgment is subjective. In opposition to these subjective judgments, which depend almost entirely upon the opinion of the individual, we get measures where the unit employed is standardized. The distinction between the subjective scale (which rates in terms of excellent, good, poor, bad) and the objective scale (which expresses ability in terms that are constant in value and universally understood) cannot be too clearly made. In the use of a perfectly objective scale all competent persons agree, while in the use of a perfectly subjective scale, all competent persons disagree save by chance.

Some account of the way in which the words *trade* and *proficiency* are used will clarify thought and simplify the presentation. By trade we shall mean what is more commonly designated as "occupation"; thus within *trade* we include such diverse callings as those of surveyor, cook, turret lathe operator, statistician, typist. This is perhaps at variance with the ordinary usage of the term, which emphasizes the opposition to a profession. The chief restriction on the meaning of the term occupation as here used, is that it does not include activities primarily concerned with the exchange of goods; by occupation we mean rather a calling in which it is necessary to acquire facility in the use of certain tools, instruments and machines in order to produce certain physical results. A further restriction

¹Through the courtesy of the publishers, permission was given me to use material from a much fuller account of this subject, to which the reader is referred for further information. "Trade Tests," J. C. Chapman. *Henry Holt & Co.* 1921.

on the use of occupation is that this acquired facility or skill is for the most part considered to be a combination of a complex set of intellectual and muscular coördinations, such as is commonly found in carpentry, interior wiring, auto-repairing, telephone repair, and not to be made up of a very narrow range of simple and oft-repeated coördinations such as are characteristic of the standardized operations of much of the highly specialized factory production.

The word *proficiency* is used to signify the power which a tradesman has of meeting the varied situations which arise within his occupation. The term "trade proficiency," therefore, signifies what is commonly meant by a man's competency to follow his trade, occupation or profession. In more scientific language it refers to any complex set of coördinations which are acquired in a fairly definite order and which characterize all men skilled in a given trade, thereby segregating them as a homogeneous group. The reader must not confuse this with the ability to answer certain questions or perform certain tasks, which is measured only in order to give an indication of true trade ability according to the above definition.

ORIGIN OF ARMY TRADE TESTS

The demands which the army made on the methods devised for measuring trade ability were:

1. The methods must be applicable to all trades.
2. The methods must be such that they can be employed by an intelligent examiner who has no personal knowledge of the trade.
3. The methods must differentiate between men of varying trade abilities and knowledge.
4. The methods must yield a rating of a man which is independent

of the examiner's individual judgment, in other words, the test must be objective and not subjective.

5. The methods must be rapid, and in most cases must not require the use of tools or apparatus.

To meet these demands the trade test method was evolved. Any new method is merely a skilful combination of previous devices. When a small group met in order to discuss ways and means of solving this new problem which army conditions had presented, the first inquiry that was made was relative to the practice that then existed in the large industrial plants. In these plants the conditions more closely paralleled those of the army. In many cases there was a central office where all matters of employment and selection were handled. The methods used in these central offices were found to be very diverse. In some cases the men in charge of the employment offices, who did the interviewing, were mere clerks who made no attempt to go back of the statements of the applicants but referred the latter to the various foremen in the plant for try-out.

Another method extensively used, especially in the more progressive plants, was to have in the employment office, or to release for certain hours of the day for work in the employment office, skilled workmen representing the various trades in which hiring takes place. It may be well to discuss some of the disadvantages of this common method. In the first place, the men who are doing the interviewing are chosen, usually, not because they are skilled interviewers, but rather on account of skill in their own trade. For this reason their attitude toward the men often results in failure to extract the knowledge which the applicant possesses. Second, the questions asked by the interviewer are

frequently catch questions or else questions involving a knowledge of a very detailed and perhaps local process; frequently found also are questions which can be answered by a mere yes or no, without signifying any trade ability on the part of the applicant, who merely guesses. Another disadvantage is that the ratings given, on account of the lack of standardization of questions and answers, are essentially subjective and not objective. The first disadvantage in itself ruled out the possibility of its use in army camps. Skilled workmen were required for skilled work; they could not possibly be spared in such numbers as the above method would demand, merely to serve as a selective or placement force.

A further method used, though not so extensively, in employment bureaus and large plants was to have, in the main, trained clerical assistants in the employment office, but the interviewing force, by contact with foremen, was given facilities to discover the nature of the various occupations and the general processes involved. This general method, while not suited immediately to the army requirements because of its vagueness, possessed certain characteristics which were most suggestive to those studying the ways and means whereby certain phases of the selective work of the army could be met. Its most important feature was the fact that it did not require skilled tradesmen as interviewers. As will be seen later, this method of examination, when greatly modified and systematized, developed into the oral trade test.

The problem, therefore, that confronted the army was to adapt and improve these methods to meet the army requirements. The first essential was that the method be such that it should not require a skilled

tradesman as an examiner. The other equally important consideration was that the examination or interview should yield a definite objective rating.

Since 1910, a great deal of work had been done in connection with a somewhat related educational problem. Just as it is necessary for industry to have rapid and accurate methods of determining the skill and knowledge of its workmen, so it is equally necessary for the school, if it is to be efficient, to have methods of determining the skill and knowledge of its pupils. To place and direct each pupil to the best advantage and to have some check on the instruction demands the construction of objective scales or tests for school subjects. Such objective tests have been worked out in many of the common school branches, of which the most important are those in writing, reading and arithmetic. The trade test movement is virtually the story of the refinement of the ordinary selective methods of industry by application of the statistical and other devices which have grown up largely within the realm of educational measurements.

With this general introduction we are in a position to discuss the various types of trade test which were employed in the army. These are: (1) Oral trade test; (2) picture trade test; (3) performance trade test.

THE ORAL TRADE TEST METHOD

The oral question is a time honored method of testing ability, particularly when this ability is of an informational kind.

If this ability consisted of nothing more than the possession of certain information in regard to the trade, the oral or written question would be the obvious method of measuring proficiency. But the simplest analysis of trade ability shows that it consists of two factors, which for the purpose

of emphasis can be separated. These are:

1. Certain skill or technique in performing operations.

2. Certain knowledge or information. The two are closely inter-related. Without a considerable amount of information about the trade, the performance of many of its operations is out of the question. Likewise, assuming the presence of certain information, only the minimum of manual dexterity is required to perform the operation.

If there is a very close correlation between degree of skill and amount of information possessed, then an examination which would test the amount of knowledge of the trade would serve also as an indication of the degree of skill. If, however, there is no relation between information possessed and corresponding skill, then any examination which tests merely information would be doomed to failure, for it would give no indication of the first important factor in trade ability, namely, skill in carrying out the various operations. Before oral questions can be used to test trade ability, this crucial problem must be faced: To what extent can total trade ability be measured merely by testing the information of a workman with regard to his trade, without witnessing his dexterity in trade operations, or observing the products of his work?

It was realized, however, that no amount of dogmatism or argument could settle this question. The decision depends on evidence alone. If oral questions in certain trades do, as a matter of fact, differentiate various degrees of trade ability, then the assumption of a close correspondence between skill and information in those trades is correct; if they fail to differentiate, such an assumption is untenable.

There is, of course, no limit to the scope of a question. It can demand for its answer the widest information on the one hand, or it may merely concern itself with the most specific detail. Examples of questions of both of these types may be given. An extreme of the first type would be: "Suppose a car was left in a garage for repair, and you were not told what was wrong. How would you proceed?" An illustration at the other extreme would be: "What joint is there between the differential and the transmission?" A complete answer to the first question would involve a lengthy description of the majority of the processes in automobile repair. The answer, to be tolerably full, might well consume several hours. No two mechanics would answer the question in the same manner. Again, consider how such an answer could be rated. Suppose ten points were to be assigned to this question. What would constitute a score of 10, 8, 6, 4, 0? Contrast this first question with the second question. To the latter one word, and one word only is the correct reply: "Universal." The question calls for a most specific answer and no two examiners can disagree on the rating. If instructions call for a credit of four points for the answer "Universal," and zero for all other answers, there is no room for doubt concerning the credit to be given.

For purposes of convenience we shall designate these two contrasted types of questions according to the answer called for as (1) multi-answer questions; (2) single-answer questions. It may be well to consider the merits and demerits of these two types of questions from the standpoint of their application to the army problem. The multi-answer question is by far the more familiar; whenever the question and answer method was being employed in industry, it was this type

which was found. Employment offices, trade unions and examining bodies, such as Civil Service Commissions, had in a large number of trades series of these questions which were available for any purposes. Moreover, this kind of question enables the examiner to discover whether the workman understands the whole process; there is no restriction as to the ground covered. So much for the advantages of the multi-answer question. Its great drawbacks are, first, that it requires for satisfactory use an examiner who has trade knowledge, and second, that it is absolutely impossible to standardize the answers to the question so that examiners at different places and under different conditions would give the same rating for the same answers.

The single-answer question, on the other hand, does not necessitate trade information on the part of the examiner. Where the question is so worded that there is only one possible reply, any examiner who can read is capable of conducting the examination. What is more, there can be no disagreement concerning the credits given. The disadvantages of the method from the standpoint of adoption in the army, were twofold. In the first place, there had been no systematic attempt, before 1917, to try out questions of this type. There were no sets of questions available, constructed on these lines. In addition, it appeared very doubtful whether specific questions, which had merely a single answer, would fulfill the main function for which the tests were to be given, namely, to differentiate the various degrees of trade ability. No method, however suitable for non-technical examiners, however objective the results it might yield, could be employed unless, with a considerable degree of precision, it separated work-

men into classes according to their general trade knowledge and practical usefulness.

The differentiations which it was expected that any method of examination must perform were more or less laid down by army requirements. The army distinguishes in any particular trade between four types of men: Novice; apprentice; journeyman and expert.

To define exactly what is meant by each of these terms is out of the question. While the novice is an intelligent adult who has had no experience in the trade, the apprentice is supposed to possess the information and skill of the man who has spent a reasonable amount of time as a learner or helper in the trade. As a matter of fact, the army system of classification is archaic, for the old apprenticeship system upon which it was founded has largely ceased to exist and has no significance in the newer trades. The journeyman was defined as an individual who has passed the apprenticeship stage, whatever may be the period which this apprenticeship occupied. In addition, the journeyman, according to army usage, must not have had exceptional experience or possess a thorough, all-round knowledge of the trade. When this is the case, the army defines the standing by a special term, which is unknown in industry. The term is the so-called expert rating. An expert, by army definition, is "a man who has had not less than five years' experience as a journeyman and who has shown a superior knowledge of the trade, or such other qualifications as are required of a foreman."

It is now possible to discuss, in more detail, the essential stages through which a trade test must pass before its validation and employment as a measuring device for trade ability.

Compilation of the Questions.—Para-

doxical as it may seem, the success of the trade test method was largely due to the fact that those who compiled the questions were not expert tradesmen. This necessitated constant contact with trade conditions. While the compiler of the question took advantage of the literature on the trade, the larger number of the questions came directly from foremen and experts. Even when a question was suggested by books or previous examinations in the trade, it was always talked over with numerous practical tradesmen before it was included in the first trials. The work of the compiler and the tradesman was usually complementary. While the trade expert furnished the necessary knowledge of the processes of the trade, the questions that he propounded were usually of the vague, multi-answer type. It was only in the rare case that the expert framed questions of the kind required for the purposes of an objective trade test. Such being the case, the business of the compiler was, on his side, to analyze and examine the questions and problems proposed in order to convert them into questions which elicited only a single answer. He was also responsible for seeing that the questions covered a wide range of the processes of the trade.

Preliminary Testing of Questions.—The fifty or sixty questions which were obtained during compilation were administered to a number of tradesmen, usually from nine to twelve, the apprentice, journeymen and experts being about equally represented.

The method of giving the examinations was completely standardized. No help by gesture or emphasis was to be given the tradesman. The examiner was allowed, however, to use certain "follow-up" questions when the answer given by the tradesman

seemed to be to the point but did not correspond with that given in the test. These standardized follow-up questions were:

1. Anything more?
2. Any other name for it?
3. Any other way of saying the same thing?
4. Any other way of doing it?

The full answer to each question was recorded verbatim, together with any of the above follow-up questions, which were employed to elicit further information. Full notes also were taken of any significant comments made by the tradesman.

In the light of these answers, the fifty or sixty odd questions were then examined carefully one at a time. Certain questions were eliminated for one reason or another. Some were reworded or changed in form and in others additional answers were added which the try-out had shown were correct alternatives to the original answer. This process reduced the questions to a small enough number, usually thirty to forty, to admit of easy standardization. Care was taken to see that the remaining questions were sufficiently wide in scope to represent different degrees of trade ability. These questions, with their answers, were then ready for the next stage of the process, namely the final try-out for purposes of accurate standardization.

Final Testing of Questions.—The final testing of the question was merely an elaboration of the method used in the preliminary testing, which has just been described. Instead, however, of using three apprentices, three journeymen and three experts, the test was now administered, in full, in each one of the four groups, to twenty men who were known to be typical representatives of the four classes—novice, apprentice, journeyman and

expert—eighty men in all. The novices were usually college students and the tradesmen were obtained from a number of representative industries in three different geographical centers. The answers were recorded verbatim.

Statistical Treatment of Results.—The first step before commencing the statistical treatment proper was to examine roughly the answers to each of the questions. A rapid examination of this kind revealed at once that some questions could not be employed. The most common causes of this rejection were:

1. Correct answers to the questions were so varied that it was impossible to conform to the objective requirement of marking.

2. The process in the trade upon which the question was based, on further examination, proved to be doubtful practice.

3. The question proved to be suitable for one locality, but not for general use.

4. On examination a certain ambiguity would be revealed in the question.

5. The question failed to differentiate the various levels of trade ability.

Calibration of the Test.—When the final selection of questions had been made, the only problem that remained was that of establishing the standards to be considered characteristic of the expert, journeyman, apprentice and novice classes. Using the physical analogy, the process is commonly called "calibrating" the test. Usually in the army the final test consisted of fifteen to twenty questions. This, however, was a purely arbitrary number chosen for purposes of speed in assembly and ease in administration. What was required of the army instrument was primarily speed. There is

no reason why fifteen to twenty questions should not be replaced by forty or fifty questions, if such an addition furnishes valuable information with regard to the trade standing of the workman.

The problem of calibrating the test would be an easy one if the following two conditions were fulfilled:

1. If the classifications of the sixty tradesmen tested were perfectly accurate indices of each man's total trade ability.

2. If at each level of trade ability there was a distinct standard of performance, with no overlapping of the various groups. Neither of these conditions was, however, fulfilled, but in general the classification was reasonably reliable and was certainly accurate enough to serve as a very good test of the trade test itself. These two considerations would make us rather expect a small overlapping in the performances of the various groups.

Using the well established method of critical scores, the range of achievement for each of the four levels of ability was graphically determined and fixed so as to yield the minimum of displacement of trade status among the eighty men tested.

Final Assembly of Test.—Other things being equal it is advisable to arrange the questions in the test in the order of their difficulty. This serves the double purpose of establishing, by starting with easy questions, the confidence of the person under examination, even though he may be an expert, while in the case of the apprentice, it prevents discouragement due to early contact with questions which are quite outside his range of information.

The following test taken from about forty similar tests, illustrates the general form of the oral trade test:

TRADE TEST

BRICKLAYER.—General

Oral

COMMITTEE ON CLASSIFICATION OF
PERSONNEL IN THE ARMY

TRADE TEST DIVISION

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Adjutant General

Question 1

Q. What are headers used for in a brick wall?

A. To bind (bond) (tie). Score 4

Question 2

Q. What is half of a brick called?

A. Bat. Score 4

Question 3

Q. What is used in the middle of a long wall to keep the line level?

A. Twig (twigger) (twigging) (tingle). Score 4

Question 4

Q. In coming to a height if there is a course of brick difference in the level, what do you call it?

A. Hog. Score 4

Question 5

Q. What is a brick called when set on end?

A. Soldier. Score 4

Question 6

Q. What do you call a course of brick laid lengthwise of a wall?

A. Stretchers. Score 4

Question 7

Q. What is a bond called when a header and stretcher are laid in the same course?

A. Flemish. Score 4

Question 8

Q. What do you call the top course of stone on a wall?

A. Coping. Score 4

Question 9

Q. What is a brick called when cut in half lengthwise?

A. Soap (King). Score 4

Question 10

Q. In setting a sill course how much pitch do you give it?

A. $\frac{1}{4}$ to $\frac{3}{4}$ inch. Score 4

Question 11

Q. How do you tie-in the front work of a building in plain bond work if you have no metal ties?

A. (1) Clip (clip course). Score 4

(2) Blind (secret) header. Score 4

Question 12

Q. What is a brick called when set on the narrow edge?

A. Rowlock. Score 4

Question 13

Q. What do you call the bond when you have a course of headers first, then a course of stretchers, and then another course of headers?

A. (1) English. Score 4

(2) Dutch. Score 4

Question 14

Q. What is the course called from which an arch starts?

A. (1) Spring (springer) (springing course). Score 4

(2) Skew-back. Score 4

Question 15

Q. How do you get your courses uniform?

A. (1) Story (gauge) rod. Score 4

(2) Story (coursing) pole. Score 4

Rating the Candidate

Score	Rating
12 and below.....	N
13 and 14.....	A-
15 to 41 inclusive.....	A
42 and 43.....	A+
44 and 45.....	J-
46 to 50 inclusive.....	J
51 and 52.....	J+
53 and above.....	E

There is no E- or E+ rating.

THE PICTURE TRADE TEST METHOD

The picture test method resembles so closely that used in the purely oral test that it will be unnecessary to discuss the picture tests at length. The stages passed through in its construction are essentially similar to those which have just been described for the oral tests. The account which is here given will limit itself, therefore, to the

consideration of the reasons for the use of pictures and to a criticism of this method of examination.

Undoubtedly the major reason for the introduction of the form of test in which actual pictures of tools, machines and processes were employed was the attempt to get nearer to the conditions under which the trade is performed. The fact is accepted that the best prediction of ability in any activity is given by that test which in its essential structure most closely resembles the given activity.

Where pictures of tools, machines and operations are present, the general impression produced on the tradesman is that the examination is much less abstract; although he is not actually handling the tools or running the machine, he feels much more at home and is more liable to have confidence in himself as well as trust in the examination. One of the difficulties that was anticipated in the use of the oral test method was the presence of so-called "motor-mindedness" in many tradesmen. That is, there were thought to be tradesmen who would do the job, but were completely unable to answer questions. The results of the oral tests tried out on thousands of men have shown that such individuals virtually do not exist or, if they do, they form such a small percentage of the total trade population that they need not be given consideration. This, however, does not prevent a large number of employers and workmen from still holding and being influenced by this popular notion. To such employers and tradesmen the picture test method will commend itself.

In this form of examination the same type of answer, preferably the one-word answer, was adhered to. The questions employed were altered both in their form and content to make them suitable for investigating the

subject's knowledge of the trade process to which the pictures were related.

The advantages of the picture tests are:

1. The picture test approximates more closely the actual situation in the trade.

2. The tradesman has more confidence in the method; it appears to him to be much more practical than the purely oral method.

3. The picture test admits of more intricate questions.

4. It is less subject to coaching.

5. The picture will often call forth a piece of information which the tradesman might be unable to recollect without the association value of the picture.

Generally speaking, the picture tests did not differentiate the trade levels with any greater degree of accuracy than did the oral questions. They did, however, establish an understanding between the examiner and the tradesman which was sometimes noticeably lacking in the case of the oral tests. Though in by far the majority of cases the candidates were certain that the oral tests were fair, in a few cases the examiner could not help noticing that the man felt that he had been given a very theoretical examination. Even though, as a matter of fact, this idea was erroneous, in view of the rigorous standardization to which the oral tests were subjected, it is a human factor which must not be overlooked. Considering the importance of human relationships in industry it would seem that even a slightly inferior type of examination which appeals to the workman as essentially practical is of greater value than a more accurate measuring device which arouses suspicion as to its fairness or practicality.

But accompanying these merits are the following disadvantages:

1. The construction of the test is more laborious insofar as pictures, diagrams or photographs have to be procured.

2. The cost of production is greater.

3. It is more awkward to give and takes a longer time than an equal number of oral questions.

4. There is a greater danger of unfamiliarity, due to the fact that the machine or tool or process pictured is not identical with that used by the tradesman.

5. The pictures are themselves liable to get out of date; that is, ten years' progress in a trade would throw out a greater proportion of the picture questions than of oral questions.

6. Many men of limited intelligence are not accustomed to reading diagrams or interpreting pictures. As we have already stated, a combination of words and pictures might appear to be an easier form of examination than that furnished by words alone. That is, the pictures might clarify the meaning of the words. This assumption, however, was not verified by practice, except in the case of the expert. Often the picture makes it more difficult for the man to focus his attention on the question which is being asked, for he tends to study the whole picture and his thoughts are diffused over a wide area. With the less skilled and less educated, particularly where there is a slight language difficulty, the pictures seem in one way or another to complicate the mental process. It was found that the lower type of man, in the attempt to direct his attention simultaneously to the words of the question and to the picture, became confused. For such men there is no doubt that the oral method of examination is superior.

7. Where several questions depend

on a single picture, the failure to recognize this picture unfairly penalizes the candidate.

It would appear that the advantages of both the oral method and the picture method could be combined. The use of pictures in a few questions would not only establish confidence in the form of examination, but it would also enable certain very valuable questions to be asked which could not be introduced in the oral examination.

THE PERFORMANCE TRADE TEST METHOD

The performance test is nothing more than a standardized, practical trade job, involving the use of blue prints, material and tools characteristic of the trade. The word performance is here used in an arbitrary but definite way. It means the carrying out, with the help of tools and equipment, of certain processes of the trade. This method of testing is more closely related to that which has been used in industry than any of the methods previously described. The most common method, after the preliminary interview has taken place, is to refer the applicant to that department in which he claims to have skill. On reaching this department the actual test for skill may be of two kinds. In one case the tradesman is actually put to work, using the tools of the trade in the actual job for which he is hired. His success or failure during the first two or three days determines whether he has the necessary skill. Another device, less frequently employed, is to try the man out on a single representative operation of the trade. His success or failure in this one typical job is used as an index for estimating his total trade ability.

The performance test method possessed so many advantages that it was well worth the time to investigate

whether or not the obstacles facing its employment could be surmounted. Many occupations exist in which it is almost wholly a question of degree of skill rather than range of information which distinguishes between different degrees of ability. The oral and picture tests measure trade skill indirectly by ascertaining the amount of information possessed by the tradesman. This method, however, breaks down completely when there is no high correlation between information possessed and trade usefulness. In the case of stenography, the distinction between the poor typist, or even the learner in typewriting and the trained expert does not lie in the information possessed. Both know, so far as any oral test could reveal the fact, the position of the keys on the machine, the forms in which a letter or document should be written, etc. The distinction lies in the speed possessed by the expert as compared with that found in the slower typist. To differentiate these degrees of trade usefulness, the performance test, where the individual is actually given a piece of work to do, is the only possible resort. The same is true for such occupations as truck driver, computer, clerical worker and countless other occupations where information is a minimum and skill a maximum. This condition is found to a great extent in modern production methods of industry, where the process upon which the tradesman is engaged is exceedingly specialized, demanding a minimum of knowledge and a maximum of speed.

The performance test is also indispensable in the examination of tradesmen who are unable to speak the English language. In certain important occupations in many parts of the country the skilled work is being done almost exclusively by men who are incapable of being tested by any

method involving language to the degree called for by the oral and picture test. Where this situation exists, the oral or picture test is much more a measurement of language facility than it is of trade information, and for these reasons, where the tradesmen are not English speaking, the findings are very misleading.

A further advantage of the performance test is found in its obviously practical nature. It has already been emphasized that, other things being equal, any trade test is advantageous to the extent to which it reflects the shop conditions under which the ordinary workman follows the trade. The performance test possesses this great merit and on this account establishes the confidence of the tradesman both in himself and in the method of examination. The considerations enumerated above made the use of the performance test method indispensable as part of the army selective machinery.

The greatest difficulty that has to be faced is that of procuring an adequate sample of trade ability by a single performance test. In connection with the oral method of examination the question of the random sampling of trade information and trade ability arises. In general the complex which is referred to as trade ability consists of many elements of information and a large number of skills. It has been proved that in many trades fifteen to twenty questions, so chosen as to cover different processes of the trade, can be used as an adequate sampling of total information. It is obvious, however, that as the number of questions is reduced, the assumption that the test will give an indication of general trade information and ability, becomes increasingly dangerous.

If, with twenty questions, involving twenty different phases of the total

occupation, there is difficulty in securing a random sampling, how much greater is the difficulty in the case of a single operation! The reader may be tempted to ask, "Why was it necessary to restrict the performance to a single job? Why could not the performance test cover a large number of different operations of the trade?" The reason that many operations could not be included in one composite test lay in the limitations as to time and expense fixed by the army situation. To overcome this difficulty of sampling, great care had to be taken in the selection of the representative task given. The final rating can be made on the following considerations:

1. Observation of tradesman while engaged in the processes of the trade.
 2. Examination of the resulting product.
 3. Consideration of the time taken, either for a particular process, or for the producing of a particular object.
- In addition, combinations of the first and second factors, second and third factors, and of all three may well be used in the construction of a performance test.

As to which one of these methods shall be employed, the decision depends on the conditions for which the test is designed. To meet army requirements of speed and objective scoring by non-tradesmen the product-time method is usually the most useful. In certain cases, however, as in the auto driver, the process test can be used to greater advantage. With reference to the process method, it may be noted that although time is not actually measured it is not wholly neglected, for the conditions of the experiment naturally set a limiting time for the carrying out of the operations. Provided the procedure is gone through within this time, which is ample, no note is made of the speed of the operation. The

more this relationship is analyzed, the clearer becomes the fact that the product-time test covers almost everything involved in a process test.

Assuming, therefore, the general advisability of using the product-time test, the question as to which operation should be chosen depends on a number of factors. Among these the following need special mention:

1. The operation should be sufficiently exact, so that time and product admit of accurate standardization, thereby enabling objective judgments to be made.
2. The combined ratings of time and quality of product should differentiate men of different levels of trade ability.
3. The task should be of such a nature as to command the respect and establish the confidence of the tradesman.
4. Equipment, material and tools must be reduced to the smallest practical quantity and must be capable of standardization, so that all tests can be given under the same conditions.
5. The operation must not require undue length of time for its completion and should contain within itself as little repetition of procedures as possible.

The operation was chosen after consultation with a number of experts. It was then simplified so as to facilitate objective scoring. The standardization and calibration was essentially the same as in the oral trade test.

Owing to space limitations only one type of performance test can be reproduced. It serves, however, to illustrate the general nature of the test.

TRADE TEST

STENOGRAPHER AND TYPIST.—Typist

Performance

COMMITTEE ON CLASSIFICATION OF
PERSONNEL IN THE ARMY

TRADE TEST DIVISION

Reproduced by permission of the
Adjutant General

Instructions to the Examiner

1. Make sure that the typewriter is in good condition. The only form of supplies needed is typewriter paper, 8½x11.

2. Say to the candidate: "Be seated at this typewriter. Insert paper and adjust the typewriter for single space."

3. When these instructions have been complied with give to the candidate the loose sheet of test copy and say: "Copy this as rapidly as possible, making no erasures and as few mistakes as possible, and report to me as soon as you are through."

4. Record the starting time in minutes and seconds. This represents the time at which the copy is handed to the candidate, not necessarily the time that he begins to write.

5. Record the time when the candidate gives to the examiner the finished typewritten copy.

6. Record on the candidate's individual score card his name, and the total time in minutes. Ignore the fractional part of a minute.

7. Determine the number of errors. An error is any error in a word or the space or punctuation immediately following a word. A word which has several errors is counted as *one* error. Record the number of errors on the score card.

Copy

The truck company is normally organized into three sections of nine trucks, each section under command of an assistant truckmaster. The service trucks not forming an integral part of the cargo sections are usually kept under the immediate orders of the truckmaster. When the company is not operating as a train, or when gasoline-supply trucks are not needed, these trucks may be assigned to cargo work, and in such case should be attached to sections.

The administration of a truck company is identical with that of a company, troop, or battery. The company commander is responsible for the operation, supply, and discipline of his command. He is assisted

by the truckmaster, whose duties are analogous to those of a first sergeant. The truckmaster is the executive, and sees that all orders or instructions are properly carried out.

Each assistant truckmaster is responsible for the discipline of the men of his section, and for the proper operation and up-keep of the equipment assigned thereto. All orders or instructions to various members of a section should be given to the assistant truckmaster in charge thereof and he should be held rigidly accountable for the condition and operation of his section.

The assistant mechanics are under the supervision of the mechanic, who should be under the immediate supervision of the truckmaster. They perform such mechanical work as the company commander may direct.

The mess sergeant has general charge of the mess, and the cooks are under his supervision. He has control of all materials and supplies for the company, and is accountable for their proper issue and use. He is assisted in care and issues of property by one of the assistant chauffeurs, usually by assistant chauffeur of the light repair truck or cargo truck clerk, etc. The company clerk keeps all records of personnel, property and operation, and performs such other duties as the company commander may require.

Rating the Candidate

1. Multiply the number of minutes by ten. Ignore the fractional part of a minute.

2. Add the number of errors.

3. This sum is the candidate's score. Rate the candidate according to the following table:

<i>Expert:</i>	0 to 85 inclusive with not more than five errors.
<i>Journeyman:</i>	0 to 86 inclusive with more than five errors.
<i>Apprentice:</i>	87 to 150 inclusive
<i>Novice:</i>	151 and above.

THE TRADE TEST METHOD
IN INDUSTRY

The question of the extent to which the measuring devices of the army can be applied directly to industry depends

upon the extent to which the conditions of an industry coincide with those of the army. In a very real sense, the effective utilization of the available skilled personnel within the army was essentially a similar problem to that which is faced by the employment office in large industrial plants. The army on a large scale, the employment manager of an industry on a smaller scale, must function to bring man and job together with due regard to the qualifications of the former and the demands of the latter. Trade tests in one form or another will accomplish this purpose, if they are made an integral part of the total mechanism of placement. Just as in the army it was necessary to know the number of men with various trade skills that were required, together with an exact knowledge of the duties within each of the trades, so it is necessary in the industry, before any system of trade testing is set up, to conduct a thorough survey of occupational needs and requirements. Adequate knowledge of the employment situation within a plant necessitates, at its inception, a complete analysis of the various occupations represented. Job analysis, or occupational specification, is the forerunner of the construction of an accurate placement scheme.

It is obviously a waste of time to attempt to analyze the human element when there has been no corresponding analysis of the jobs to which the human material is to be assigned. The analysis of the man and the analysis of the job are interwoven throughout the whole process of placement. One of the lines along which there is a possibility for a great saving of human material lies in the direction of much more detailed investigation of the various occupations within the confines of the industrial plant. If one considers the way in which the processes of industry

have become more specialized during the past twenty-five years, how new trades have come into existence and older trades have been split into various minor trades, the necessity for this step becomes apparent.

Again, the growth in the size of plants has made the old method of hiring through the shop foreman unwieldy. It has become necessary to centralize the employment operations, with the result that a single office must hire men for all types of work within the plant. In this respect the conditions within the industry resemble the army situation. When it was possible for foremen to do the hiring, their first-hand knowledge of trade operations enabled them to give a very searching examination, covering the most involved operations of the trade. Even under these conditions there were, however, numerous disadvantages, of which the most important must be mentioned. In the first place the rating that was given was the result of a general estimate made by a particular person. This resulted in a complete lack of standardization of rating. A foreman and an assistant foreman, interviewing the same applicant in the same shop, would give very different judgments with regard to ability. Even when the same judgment was arrived at, there were no objective terms in which it might be expressed. Foremen were influenced also by many extraneous elements, quite apart from the skill possessed by the applicant. In many cases the questions given or the jobs assigned were of a catch nature, calculated rather to impress the applicant with the knowledge of the examiner than to elicit information with regard to the skill of the tradesman. Herein lay the great weakness of the method. The foreman was chosen on the basis of considerations other than those of skilful interviewing,

He was much more likely to be a skilled workman than a skilled interviewer. It would be absurd to say that this method of employment is unworkable. It is claimed, however, that under ordinary conditions it is a very wasteful procedure. This method of decentralized employment has been abandoned, not because the foreman was not a skilled examiner, but because of the growth of the industries themselves. In the interests of reduction of labor turnover and in the interests of production, it became necessary to have the hiring done by a small group of men. When this centralizing takes place, intimate knowledge of the operations of the trade can no longer be expected of the examiner. While it may be possible in a few of the most important occupations of the plant to have specialists within the employment office, it is utterly out of the question to have experts in all of the occupations concerned. The work of employment, therefore, has had to be handed over to a small group of specialized men who can have, from the nature of things, only the most superficial knowledge of the jobs for which they are doing the hiring. To serve as a guide to these specialists the trade tests have a proper place.

The use of the methods of job analysis and the application of trade tests, are not theoretical ideas which will have to fight for a hearing. The situation in almost all large industries is crying out for some device which will meet the present difficulties of

operation. Every large employment office, either through its follow-up work, when using methods of general interview, or else through its expensive office payroll, when the examinations are conducted by experts, knows how necessary is some radical change to better the mechanism of placement. Just as in the army the occupational specifications and trade tests came into existence to meet urgent demands of the personnel officers, who saw that their own methods were completely breaking down, so also in industry job analysis and trade tests are being employed to fill a want, the magnitude of which is best known to the employment office itself.

The success of these new methods in the industrial field will depend upon a vigorous adherence to the scientific procedures which were employed in the army situation. Joint research may have to supplement the efforts of individual plants. The changing conditions of the industrial situation will demand that the problems centering around the measurement of trade proficiency be subject to continuous research under the practical conditions out of which the problems originate. The trade test method of the army and the trade test methods used by a few plants today must serve as the starting point for future investigation. The actual instruments now available are of little value compared with the methodology which brought them into existence.

Tests for Office Occupations¹

By C. S. YOAKUM and MARION A. BILLS

EXECUTIVES in progressive companies have realized for many years that the turnover and inefficiency of the office personnel represents one of their heavy losses, but have believed that this loss was inevitable. In the past, selecting and promoting employees for clerical positions as well as for all other positions has been based on many factors other than ability and efficiency. This condition is, however, gradually changing and in more progressive companies scientific methods are at present used with a high percentage of success.

In selecting clerical employees three sources of information are: (1) a carefully filled-out personal history blank; (2) an interview with the applicant; and (3) tests which will determine their ability and skill to handle the job for which they are applying and jobs in direct promotional line.

This article deals only with the third of the three items, namely, tests. A person doing employing usually goes through a certain transition of feeling concerning the relative importance of these three items. At the beginning of his hiring experience he rates the interview as being by far the most valuable, the application blank is rated second and the tests come last as least important. Gradually these change places and after a few years' experience the tests are rated as the most valuable of the three. It is very common to have an experienced employment manager say that if he could know only one

thing about a person applying for a clerical job, he would take the test scores rather than the other items.

Taken as a whole, tests have been more successful in sorting out undesirable candidates for clerical work and in selecting desirable ones than for any other occupation of which we know.

In order to evaluate tests properly and use them successfully, office work must be divided into classes or grades. As a rough division we have executive or planning work, supervising, individual work and machine operating. Several careful classifications have been worked out and are at present in force. Due to the fact that the higher grade jobs are fewer in number than those of the lower grade, and further, since in most companies these higher jobs are filled from the ranks of the older employees, the problem becomes that of selecting for the lower grade jobs the right type of material. In addition to the job classification there must also be found a measure of efficiency of the employee on the job. Since in almost all clerical work it is difficult to find a standard of production that will be wholly fair, it becomes necessary to depend for the rating of the individual on the opinion of his immediate superior or on the combined opinion of several superiors with whom he comes in contact. This, everyone clearly recognizes, is not an ideal criterion by which to judge efficiency, but to date it has proved the best we are able to obtain.

Three types of tests have been used with considerable success for selection in clerical work: (1) the general ability test; (2) the aptitude test; and (3) the trade or proficiency test.

It should be emphasized that the

¹ We are indebted to Mr. E. G. Stoy for assistance in working over much of the data presented and the elimination of much of the inconclusive material published in scattered papers.

procedure in applying any of these tests and in proper posting of records in permanent form cannot be treated lightly if success is to be attained in personnel practice. We are not dealing with magic. It is only with the temporary sacrifice of a certain amount of time, energy and money, with always a true regard for detail, that accomplishment is possible. In other words, we must have whole-hearted coöperation on the part of management. The redeeming features of this apparently slow and unnecessary procedure are the resulting drop in turnover with a consequent saving in time, temper, money, and, what is probably more important than even these factors, a feeling of security on the part of the employer that comes only when hit-or-miss employment methods are abandoned in favor of systematic selection.

The use of tests in employment is as yet sufficiently unusual so that relatively few persons have come in contact with them. Some applicants may therefore be suspicious and even resentful when asked to take a test. These possible situations must be kept in mind and must be avoided so far as possible by tactful handling of subjects. Tests can best be "sold" to subjects by the examiner through a frank and friendly explanation of the mutual benefit which is to be derived from the subject's taking the test. A company cannot afford to employ an individual who is unsuited to the job and the individual will not wish to be placed in a position for which he is not fitted.

I

GENERAL ABILITY TESTS

The mental alertness test has been used for almost every purpose known in employment and in the attempted solution of many general social and economic problems. The willingness to experiment with human problems

and the widespread use of this new tool indicate a healthy attitude toward questions arising out of human relations. So long as we are willing and ready to try new methods and to discard ineffectual routines, we need not fear the extreme advocates of any political or social theory. Increased knowledge, scientifically established, regarding human relations, is the best means of progress in establishing better forms of such relations. The mental alertness test should prove a valuable bit of apparatus for research. It is already, as a result of the researches to be mentioned, an important tool for practical use.

We select for summary report here several studies that will illustrate the nature and content of tests of this type, and methods of making and standardizing them. Some data are also presented that indicate the use and value of routine application of tests to prospective employees. The dozens of general ability or mental alertness tests on the market are available for trial by any concern interested. It will be many years before the final clerical tests are made and it is too early to say which form will finally prove most suitable. We have, therefore, attempted to illustrate procedures and to give examples of studies that demonstrate types of research.

L. L. Thurstone² states:

In devising a vocational test the psychologist should be guided by three fundamental considerations affecting the content of the test. (1) The difficulty of the content should correspond to the intelligence level of acceptable candidates. (2) The content should have an interest appeal to candidates who would be interested in the work tested for. (3) The special abilities should be represented in the test if there are any demonstrable special abilities. I

²Thurstone, L. L. "Standardized Tests for Office Clerks." *The Journal of Applied Psychology*, Vol. 3, pp. 248-251, September, 1919.

do not believe that office work has any special abilities that have so far been demonstrated and hence I have confined myself to the first two criteria; namely, an appropriate intelligence level and content that appeals to the applicant for an office position. This reduces itself to the same type of problem that we find so frequently in preparing vocational tests; namely, the preparation of an intelligence test out of relevant content.

Thurstone feels that the happy medium between spending two or three weeks on proof for selection of an individual by chance and spending ten minutes on proof for selection on a standard basis lies in the forty-five to sixty-minute test.

The examination devised by Thurstone consists of eight parts, as follows:

1. Checking errors in addition and subtraction.
2. Underscoring incorrectly spelled words.
3. Attention test—cancelling four letters, X, Z, U, C.
4. Code-learning test. Systematic worker soon learns letter-digit combination and gains time.
5. Alphabetizing test.
6. Classification.
7. Arithmetic test including addition, subtraction, multiplication, fractions, and percentage.
8. General intelligence test consisting of the matching of ten proverbs with ten other proverbs so that the two proverbs in each pair will have same meaning.

"The Clerical Examination is given as an omnibus test with a maximum time limit of ninety minutes for the whole pamphlet. The average time is approximately forty minutes."

The following results are given for a certain examination:

Grade of office work actually being done by the candidate correlates with:

Accuracy in test.....	$r = +.50$
Speed in test.....	$r = +.42$
Schooling.....	$r = +.47$
Age.....	$r = +.35$

By multiple correlation the following coefficients were ascertained between the grade of office work actually being done by the candidate and:

Accuracy and speed combined..	$r = +.61$
Schooling and age combined...	$r = +.52$
Accuracy, speed, schooling.....	$r = +.64$
Accuracy, speed, schooling, age.	$r = +.67$

"It is significant, as shown by these correlation coefficients, that speed and accuracy in the Clerical Examination give a more reliable prediction of ability in office work than age and schooling combined."

Lawrence Marcus³ discusses the problem of selecting from inexperienced women candidates those who will become rapid and accurate operatives of the Hollerith statistical machine. These operators have been chosen in the past for government service according to their ratings on Civil Service examinations and these examinations in their present form have been found unreliable as an indicator.

An "order of efficiency" was established in order that test scores might be correlated with efficiency. This order of efficiency was based on the fact that in general, after twenty-seven months' service, a "good" operator can punch 3,200 cards per day without error. A practice curve was plotted from the data on twenty "good" operators on percentage of efficiency (calling 3,200 cards per day 100 per cent) against time in months. This made it possible to calculate the efficiency of an inexperienced operator in terms of theoretical final efficiency.

³ Marcus, L. "Vocational Selection for Specialized Tasks." *The Journal of Applied Psychology*, Vol. IV, Nos. 2 and 3, 1920, pp. 186-201.

To quote Marcus: "Since the 'Team of 5' psychological tests (see article for details) correlates .45 with efficiency at Hollerith operating, and since the Civil Service Commission's examination correlates only .31, it is believed that the 'Team of 5' is the better selecting medium."

Several reasons given are:

(1) A coefficient of .45 is well into the "indicative" zone, while .31 is below even the hazy "zone of suspicion."

(2) The "Team of 5" can be completed in 12 minutes and can be scored in 2, while the Civil Service test takes several hours to write and at least 10 minutes for careful examination.

H. C. Link⁴ gave the following tests to fifty-two men and women doing clerical work in an office in which the manager had previously attempted to rate employees as to their actual ability:

Tests for Technique

(1) A motor steadiness test (passing a metal rod between two brass bars which gradually approached one another, without allowing it to touch the bars).

(2) A simple calculation test (simple arithmetic—addition, multiplication, etc.).

(3) A card-sorting test (sorting cards from a pack of fifty, into three piles, according to certain directions).

(4) A substitution test (substituting certain letters for other letters according to a key).

Tests for Intelligence

(1) The Woodworth and Wells Hard Directions test.

(2) A mixed relations or analogies test.

The clerks who took these tests were

⁴Link, H. C. "Employment Psychology." New York, Macmillan Co., 1919, p. 40.

classified as follows: a time-study group, a ledger group, a statistical group, and a computing machine and sorting group. The table just below (Table 1) shows the comparison of the groups obtained by averaging the ranks of each individual in the tests and then averaging the ranks for each group as a whole.

TABLE 1

	AVERAGE IN	
	Technique	Intelligence
Time-study group	92	96
Ledger group	82	80
Statistical group	77	71
Computing and Sorting Machine group . .	79	69

The office manager compared the test results with his records and with his own opinion of the relative merits of the various individuals and groups and this comparison showed a marked agreement.

Up to the time of publication nine hundred and thirty clerks had been selected on the results of the tests. The results of these selections were periodically followed up and it was found that the tests had clearly been an aid.

The great difficulty, however, in finding the true value of the results was the fact that the estimate had to be based upon the personal opinions of a large number of different office and section heads. This brought into the situation the very defects which the psychological method seeks to avoid, the prejudices and variations of the human equation.

To remove this difficulty to some extent, ratings were obtained at regular intervals on all clerks selected by the tests. The ratings on 188 test cases corroborated with increasing certainty the indications of the tests as the

various office heads learned to know their workers better.

Percentage called good by their superiors:

At the end of one month.....	75%
At the end of two months.....	89%
At the end of three months.....	92%

The Scott Company reports in one of its bulletins the results of a survey made in three nationally known companies of the messenger-boy situation. The scores obtained are those resulting from the application of Series I of the Scott Company tests. The report states that:

Messenger and office boys are of particular interest because they are so definitely a source of supply for future executive material. Messenger work offers a splendid chance to learn in an intimate way the methods and policies of a company. This is an educational opportunity that should be made available only to those who are capable of taking advantage of it. The companies whose boys are discussed in this bulletin all consider that messengers and office boys are a natural and logical source of supply for higher positions. These companies desire to improve the quality of this occupational group as far as possible.

The report goes on to state that the results of tests given to office employees show that those who are most successful in their work have the highest degree of mental alertness, especially if the work is at all varied, or if the position requires initiative or judgment. In order to promote messengers and office boys into these higher grade jobs, it becomes necessary to employ boys who make a high score in the mental alertness test. But in one of these companies there was found also this condition,—that "boys who have been discharged scored on the average only 22 points in the Mental Alertness Test. The boys who were promoted scored on the average 38.6 points."

It was found that in the cases of ninety-three messenger boys in one

company resignations were most frequent among those who scored between 30 and 55 points in the mental alertness test. This range falls in the lower middle portion of the scale. A high degree of stability is found among those who make low scores and those who make high scores, with the best record of service among the latter. These facts point to the advisability of employing only high-score individuals where promotion is expected and desired, for low-score messengers cannot rise much beyond their own jobs.

The Bureau of Personnel Research, Carnegie Institute of Technology, has been conducting for the past four years extensive researches on methods of selecting clerical employees. Surveys have been completed in the offices of a number of nationally known concerns and the conclusions drawn are in the main based on the results of a test referred to hereafter as Test VI.

Test VI is a general ability test. It is a measure of one's intelligence in so far as it shows his ability to remember and to recall for use at the opportune moment such of his past experiences as affect a given situation. It is an adaptation of the Army Alpha. The items have been tested and checked against the general knowledge assimilated by the bright, wide-awake person in any of several lines of human endeavor, and have thus been so selected as to give no advantage to the specialist in any particular line.

The test contains 184 items of the following kinds: Simple opposites, re-arranged sentences to be designated true or false, simple arithmetic, arithmetic series to be completed, analogies, and sentences to be finished logically by choosing one word out of several given words. The test is given in the form of an eight-page printed booklet of standard letter size. On the cover are blank spaces in which the subject

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writes such information as his name, birthplace, whether an employe or an applicant, his position if an employe, and the date. One minute is allowed for this. At the bottom of this page is a note telling the applicant not to turn the page—that he will be told what to do next. On the second and third pages are *complete* instructions and examples of items to be found in the body of the test, and the subject is given four minutes for this reading. There follow five pages of test items arranged spirally in order to test flexibility and also to allow all subjects an equal opportunity to work on each kind of item. The answers are scored quickly by means of stencils, allowing this part of the work to be done by a clerk. A perfect score in this test is 184.

Test VI may be given to a group or to an individual. It may be interesting for the reader to know, however, that it has been found that in giving any test it is more difficult for the examiner to obtain coöperation on the part of an individual in following directions, printed or otherwise, than it is to obtain this coöperation when a group is taking the test.

The results of applications of Test VI demonstrate that it may be put to a variety of uses in an office, such as (1) the fitness of an applicant for a definite job or for a succession of jobs; (2) the advisability of the transfer of an employe; (3) the advisability of a weeding-out program. In actual practice most of the cases will be included in the first mentioned use, for once the test method is instituted and properly carried along, very little weeding-out is necessary.

When an employer wishes to fill a vacancy in his office force, he is confronted by at least two major questions which are *not* usually answered by him in systematic way. These are: (1)

"Will the applicant or applicants in

question measure up to the job?" and (2) "Will the selected applicant stay with the company?" Through the use of the test we may answer in a quite successful manner both of these questions. Based on these two questions three criteria have been used to test the value of Bureau Test VI. There has been considered first the relation of test score to position in the company; second, the relation of test score to efficiency on the job; and third, the relation of test score to permanency.

Table 2 gives a typical set of results on the relation of test to position in company. In the C class only is it non-typical. Two years ago the company felt the need of a better grade of worker in this class than they were getting and began to recruit more capable employes. The result is shown clearly in Class C. Many of the Class C workers are due for quick promotion.

TABLE 2—AVERAGE TEST SCORE VS. CLASSIFICATION OF JOB

INDIVIDUAL WORK	AVERAGE SCORE
A (Office boys).....	52
B.....	91
C.....	118
D.....	102
E.....	107
F.....	113
Supervisory high grade.....	130
Typists.....	90
Stenographers.....	106

The Bureau has on record some interesting results showing the relation between intelligence as measured by Test VI and efficiency on the job as estimated by one or more supervisors. Table 3 is illustrative of what has been found in this connection.

The results here show that (1) those rated exceptionally high tend to have high scores in mental alertness; (2) those rated very low tend to have very

low scores; (3) in the median group other factors than intelligence seem to determine the rating.

TABLE 3

RATINGS OF SUPERIORS IN PER CENT OF EFFICIENCY	AVERAGE SCORE IN TEST
Over 80	120
79 to 60	80
59	78
Below 39	20

A consideration of both the relation of test score to position in the company and its relation to permanency is given in the following study.

In testing applicants for work which has fast promotional possibilities, the applicant chosen must have a score such that it will not only be above the average for those doing successfully the work on which he will start, but will also fall in the range of scores of those who are successful in the more important jobs for which he will be in line.

Here it becomes necessary to differentiate between persons doing individual work and those doing supervisory work, for the lower grade supervisory jobs are often the reward of long and faithful service rather than of ability.

Tables 4 and 5 illustrate the promotion of higher score individuals out of the low grade jobs and the dropping of the lower score individuals out of the high grade jobs. The scores are those of 133 employees of a large public utilities company who were holding five distinct jobs that formed a clear promotional line. It should be noted that these are all individual work jobs, graded from A up to E.

The data obtained through testing these 133 employees were studied with the following questions in mind: (1) Is there a relation between positions in the company and mental alertness score? (2) Does natural selection take place in time that makes this relation more evident?

We should expect natural selection

TABLE 4—ORIGINAL GROUP

GRADE OF WORK	NO. IN GRADE	MEDIAN SCORE	PER CENT SCOR- ING OVER 110	PER CENT SCOR- ING UNDER 80
A	16	85	26	50
B	15	77.5	20	53
C	24	105	45	33
D	56	103.5	46	30
E	22	118.5	50	13

TABLE 5—GROUP REMAINING THIRTY MONTHS

GRADE OF WORK	NO. IN GRADE	MEDIAN SCORES	PER CENT SCORING OVER 110	PER CENT SCORING UNDER 80	PER CENT TURNOVER FOR THOSE SCORING OVER 110	PER CENT TURNOVER FOR THOSE SCORING UNDER 80
A	7	67.5	0	57	100	37
B	6	80.0	0	50	100	62
C	11	95.0	27	36	72	50
D	26	111.0	51	23	53	58
E	13	123.0	57	7	41	66

to take place either through persons making low scores finding themselves unable to do the work and leaving, or through persons making high scores finding the work of too low a grade and leaving.

The correlation coefficient between difficulty of work and Test VI score was found to be .22 for the original group and .41 for those remaining two and one-half years.

The cases in Tables 4 and 5 have been arranged in groups showing those scoring above 110, those scoring between 80 and 110, and those scoring below 80. The middle group contains about 25 per cent of the cases, and may be considered neutral.

The following points are noteworthy:

(1) In the original group the median scores of the grades range from 77.5 to 118.5, forty-one points. There are two instances where a lower grade job has a slightly higher median score than the next higher grade job. In the group remaining thirty months, the median scores of the grades range from 67.5 to 123.0, 55.5 points. Each grade shows a higher median than the grade below it.

(2) In the two least difficult jobs, A and B, no one scoring over 110 has remained. In the C grade a smaller per cent of the remaining than the original group have scores over 110, while for the D and E grade, a larger per cent of the remaining group have scores over 110 than of the original group.

(3) Almost the opposite holds when we consider the group scoring below 80. There is a steady decrease of the per cents scoring below 80 with the rise of the grade of work. There is also with one exception an increase in turnover in this group from A to E.

These results are as a whole confirmed by a study of 330 other cases from the same firm where many jobs were

lumped together as being of the same difficulty and the grading was much less carefully done. On account, however, of the inaccuracies that we know entered into the grading, we do not believe the results are worth quoting in detail.

The Bureau of Personnel Research has used the test for general ability rather than ones for special ability for the following reasons:

1. It seems to select as successfully as the special ability tests.

2. A special ability test gives information only on how a person can do a particular job and does not indicate whether he is fitted for the jobs along the line of promotion. For example, a girl might be hired as a file clerk; the special ability or trade test would simply tell us that she will make a good file clerk. The general test tells us also that she is or is not to be considered for rapid promotion and whether she is likely to stay content in the position.

3. It has not proved more difficult to sell the applicant the idea of this test than that of a special trade test, and one test rather than several saves time.

4. Lower critical scores for many positions have been fairly well established. For example, the instruction in one firm for a certain junior executive job is: "Do not hire anyone scoring less than 80 in Bureau Test VI; if the applicant scores between 80 and 100 proceed with caution, do not hire unless all other items are very favorable; if the applicant scores over 100 hire if other items are satisfactory."

II

SPECIAL APTITUDE TESTS

The principal topic of this section is the study of aptitude tests which have been applied to *clerical workers* and which have been published. Considerable work, however, has been conducted with students as subjects of the

experiments rather than persons actually engaged in business and industry. Those experiments which test students following courses which train them for clerical work will also be considered.

Aptitude tests may be defined briefly as those tests which seek, before the individual has had training in the process, job, or occupation under consideration, to determine the relative degree of skill and proficiency that will be attained after suitable practice periods. To build such tests requires, therefore, an analysis of the processes involved and of the individual's capacities. It also involves the establishment of definite relationships between these processes and the capacities. The probable effect of the absence of one or more supporting mental capacities must also be considered. For success in developing such tests the intermediate training processes must either be standardized or carefully controlled.

The following accounts have been included in publications which have come to our attention.

W. W. Tuttle⁵ based an experiment for the determination of ability for learning typewriting on a class of twenty beginners. The accuracy of the tests, which follow, was determined by comparing the results with the typewriting grades made by the group at the end of the first semester.

1. Quick Motor Action.—Subject taps typewriter key as rapidly as possible in a given time.

2. A Keen Sense of Rhythm.—Seashore's test for sense of time.

3. Attention and Accuracy.—In Part I the subject is given five minutes in which to underline all combinations of consecutive figures whose sum is nine. One hundred combinations occur in 9 horizontal lines of 61 figures each. In

⁵ Tuttle, W. W. "The Determination of Ability for Learning Typewriting." *The Journal of Educational Psychology*, March 1923, Vol. XIV, No. 2, pp. 177-181.

Part II the subject is given three minutes in which to underline all adjacent combinations of x and n occurring in 11 horizontal lines of 57 letters each.

4. Memory Span.—In Part I the subject writes lines of words containing five to ten abstract words after having heard them read one minute before. In Part II concrete words are used in place of abstract words.

5. Ability to Follow Directions.—Subject allowed ten minutes for performance of acts as directed.

6. Ability to Carry on the Process of Substitution.—Subject is given five minutes in which to substitute the proper figures opposite twenty-five equal lines of symbols representing the figures.

The following are the coefficients resulting from the correlation of each test with the typewriting test administered at the end of the first semester:

1. Motor action54
2. Sense of rhythm10
3. Attention and Accuracy I41
" " " II68
4. Memory Span I	-.30
" " " II	-.11
5. Ability to follow directions17
6. Substitution52

By combining the scores in tests (1), (3), and (6) and correlating the total scores with those made in the typewriting tests, a coefficient of 0.621 was obtained.

In recent years investigators in the fields of personnel work and vocational guidance have endeavored to discover more reliable criteria than those which have been so widely used in the past. This same movement has been noted in education. That is, there is a growing tendency on the part of educators to discard teachers' grades and to substitute as criteria scientific rating scales and tests which are really standard in form. E. R. Hoke⁶ de-

⁶ Hoke, E. R. "The Measurement of Achievement in Shorthand." *The Johns Hopkins University Studies in Education*, No. 6. Baltimore, The Johns Hopkins Press, 1922.

scribes an investigation covering the construction of tests for Gregg Shorthand which are free from objections to the traditional type of examination.

A study was made of four factors into which shorthand was analyzed, and an attempt was made to measure these factors, which are (1) reading ability, (2) quality of writing, (3) speed of writing, and (4) knowledge of the system as presented in the text-book.

1. In attempting to devise tests for the measurement of reading ability, several methods were abandoned in favor of a completion test composed of two actual business letters, having a total length of 500 words, with every tenth word to be chosen by the subject from one of two words given in the letters. The correct word is under-scored by the subject. This test is known as "Test A-1, Reading Ability." Forty-one boys studying shorthand in the Boys' High School, Frederick, Md., were individually given a page of printed shorthand notes (*Gregg Speed Studies*, page 156, "Productive Employment") to be read aloud for three minutes. The net number of words was taken as the gross number read minus the number of "prompted words." Exactly five seconds was allowed before help was given. The same boys were twice given, at an interval of one week, Test A-1. These two sets of scores, when averaged, showed a correlation (Pearson formula) of .55, P.E. .08 with the individual-timed reading scores. The two sets of scores obtained on Test A-1 showed on self-correlation by the Pearson method a coefficient of .80, P.E. .04.

2. In order to test speed of writing in shorthand, the pupil is given a passage to be copied which is printed both in longhand and in shorthand. Reasons for the choice of this particular form are given in the article. This

test has been made in two forms, known as "Tests B-1 and B-2," both of equal difficulty. For testing the validity of Tests B-1 and B-2, the two forms were given to thirty-four pupils. The same group was scored in words per minute on the task of copying familiar printed shorthand from a page of a text-book for three minutes. The Pearson method showed a correlation coefficient between averaged B-1 and B-2 scores (or either one separately) and timed copying scores of .51, P.E. .09.

The validity of Tests B-1 and B-2 was also verified by an experiment in which ninety-six high school pupils were given the two forms. They were also scored in words per minute on a three-minute test of their speed as shown by copying from good shorthand notes on the blackboard a fifty-word selection taken from *Rip Van Winkle*. In order to allow them to become familiar with the text and the outline, they were permitted to copy it three times for practice, after having heard it read aloud once. The coefficient obtained between average scores on B-1 and B-2 and the blackboard test was .73, P.E. .03. Self-correlation here showed a coefficient of .83, P.E. .03.

Scores on B-1 and B-2 for fifty-seven individuals showed a self-correlation coefficient of .83, P.E. .03 (Pearson).

The tests described above are those arranged for the measurement of the first two factors included in the study of shorthand. These two studies and the two based on the third and fourth factors complete the experiments on shorthand. The description of these studies is complete, and since we cannot include here most of the details as given in the report of any of the four studies, the two included may serve to illustrate what has been found. The report gives descriptions of the planning of the tests, scoring method, test forms, technique, and proof of validity.

Cyril Burt⁷ reports a study which includes both proficiency tests and tests for possible aptitude. The tests which, though used for both purposes, gave important evidence of being useful as aptitude tests are as follows:

I. Graded Tests of Intelligence:

- (1) Discriminating Opposites and Synonyms (alternative answers given).
- (2) Analogies (Alternative answers given, one correct and three incorrect for each problem).
- (3) Mixed Sentences (The examinee being required to indicate the truth or falsity of the rearranged sentences).
- (4) Completion of Sentences (The examinee being required to find the missing words).

II. Graded Tests of Educational Attainments:

- (1) Spelling.
- (2) Arithmetic.

III. Tests of Linguistic Ability and General Information:

- (1) Synonyms. (The examinee is required to think of and write down a word of similar meaning for each of those given. The given words are chosen to throw light not so much upon intelligence as upon range of vocabulary and literary precision, and incidentally, it is believed, upon certain temperamental and moral qualifications.)
- (2) Definitions. (The examinee is required to give the meaning of simple technical words. The words are especially chosen to test familiarity with some twenty-five fields of knowledge, one easy and one hard term being chosen for each.)

The tests just mentioned were given as group tests. The correlation be-

tween the test results for shorthand alone and the supervisor's order for efficiency in shorthand is .79. The correlation between the test results for typing and the supervisor's order for the same is only .60.

With the assistance of the supervisor we were able to group the typists into four groups, which may be termed excellent, good, tolerable, and practically worthless. By comparing this grouping with the results by our tests it is possible to construct standards of efficiency in this respect.

Burt concludes his first article with the following statement:

The correlations already obtained, however, seem sufficiently high to warrant their immediate practical use. It may, therefore, I think, be claimed that, although the tests are certainly capable of progressive improvement, they are already sufficiently reliable to make it possible to use them immediately for the purposes of a judgment upon applicants for posts as shorthand-writers and typists.

The progress indicated by these studies seems entirely satisfactory. No claim can be set up for completed research, but undoubted advances are being made. To be able to demonstrate practical use for such tests so early in the history of research indicates the fundamental soundness of the psychology upon which the applications are being based.

III

PROFICIENCY OR TRADE TESTS

The United States Army trade tests constitute the first extensive attempt to objectify and standardize measures of efficiency in the knowledge and skill of any subject or occupation. The rapid extension of the principle in educational circles is shown in the large number and variety of such tests now in use.⁸ Dictation exercises, short

⁷ Burt, Cyril. "Tests for Clerical Occupations." *The Journal of the National Institute of Industrial Psychology*, London, Vol. 1, Nos. 1 and 2, January and April, 1922, pp. 23-27 and 79-81.

⁸ See Monroe, W. S. "An Introduction to the Theory of Educational Measurements." Houghton Mifflin Company. New York, 1923.

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tasks related to the job in hand, have long been a common practice in employment offices. In practically all cases the standards remained subjective, i.e., if the subject of the examination satisfied the examiner it was sufficient. No comparison was made with the work of other applicants, nor were the methods of grading freed from the bias of the examiner. The trade test seeks to standardize the examination, the scoring and the subject's relative proficiency.

In the descriptions of some of the experiments already noted, there have been included some proficiency or trade tests. The following is descriptive of the method used for these tests:

E. J. Bengé⁹ has described the formation of a clerical test for the position of extender and verifier in a city gas company.

This test is composed of items taken from actual problems selected from the files of the company, such as: 1,720 cubic feet of gas @ \$1.25 per thousand feet, less 2 per cent discount. There are one hundred items in the following forms:

Extension: 1,720 cubic feet of gas @ \$1.25
per thousand feet = \$——.

Verification: 1,720 cubic feet of gas @
\$1.25 per thousand feet = \$2.15.

Right Wrong

Half of the problems of verification (25 items) have incorrect answers taken, as far as possible, from actual errors noted in the files. The items are arranged in order of difficulty and the two forms (extension and verification) are alternated. The problems of verification are arranged so as not to follow in the order of right, wrong, right. The test carries a time limit

and is given in the form of a multi-graphed or mimeographed blank.

A recent article¹⁰ in the *Journal of Personnel Research* gives in such admirable detail the steps taken by the United States to improve its clerical personnel in this field of trade tests that we could easily substitute it for this section. No industrial concern has given such intelligent thought to its problems of selection. The recent establishment of the independent foundation known as the Bureau of Public Personnel Administration with Dr. L. L. Thurstone as psychologist in charge of research on tests and employment problems adds materially to the strength of Government research in this field.

Brief quotations from the article just referred to will illustrate both the care being taken by the Government in its selection program and the technical steps necessary to prepare an educational, proficiency, or trade test.

The following is an outline of the steps in the research procedure in the study of the practical value of written examinations. (The application of this technique is illustrated in the discussion of the revision of the clerical test, on page 494.)

1. Occupations are analyzed to determine the operations they embrace and the relative importance of each.

2. Study is made of the qualifications necessary for proficiency in those operations.

3. Tests designed to measure these qualifications are constructed for purposes of experiment. Not only is attention directed to the selection of subject matter designed to measure the essential qualifications, but careful consideration is given to a number of other major factors.

The subject matter must be such that alternate tests of equal difficulty can be made.

⁹Bengé, E. J. "Simple Tests for Selecting Office Workers." *Industrial Management*, Vol. 61, pp. 91-93, February 1, 1921.

¹⁰Filer, H. A. and O'Rourke, L. J. "Progress in Civil Service Tests." *Journal of Personnel Research*, Vol. 1, No. 11, March, 1923, pp. 484-520.

The items of a given test must range from easy to difficult so as to make possible a measurement of the relative ability of applicants.

The questions or problems should be so constructed as to be clear and specific and to demand a definite answer.

4. After a test is devised which is expected to measure the desired qualifications, it must itself be tested.

To have selective value, the scores of a test must approximate the degrees of known efficiency; that is, those who make the higher test scores must, as a group, be those rated higher in efficiency in their work, while those who make the lower scores must be in the lower group in efficiency.

5. On the basis of the results of the tests an analysis is made to determine the selective value of each test as well as the degree to which the different tests measure different qualities.

6. As a result of this analysis, and of a study of the scores made by the individuals in their examinations for entrance into the Government service, it is possible to determine which, if any, of the tests in use could be dropped without decreasing the selective value of the examination. From the same analysis it is possible to determine whether or not the results warrant the addition or substitution of any of the new tests.

In order to determine the relative selective value of different tests, it is absolutely necessary to have some standards such as efficiency ratings with which to measure the value of each of the tests.

7. The best method of scoring each test is determined on the basis of the test results; that is, a study is made of the amount of credit to be given for each correct answer, or the penalty for each wrong answer, and the relative amount of credit to be assigned to such factors as speed and accuracy. This standardization of the scoring, as well as the test itself, is used only for the position under consideration.

8. A study is made of the relative importance of such factors as education, experience, age, height, and weight. Obviously, height and weight have some selective value when the position under consideration is that of policeman, but they

have little or no such value in the selection of general clerks.

9. After all findings have been verified as described, the most satisfactory passing mark is determined.

10. Follow-up studies based on the actual work of employes selected through the revised examination serve as a further test of original research, and may suggest further improvements.

We may quote also some of the statements in the article (pp. 516-518) relative to the progress being made:

As described in the preceding discussion, a revised general clerical examination has been evolved which has a higher selective value than the former examination, and which is a better index of clerical ability than the combined factors of education and experience.

In arriving at this revised general clerical examination, definite steps of progress have been made, as follows:

1. Practical clerical problems have been substituted for subjects formerly used, the evaluation of which was somewhat less reliable and which tested no important qualifications not better measured by the tests constituting the revised examination.

2. In place of dictated spelling, a non-dictated spelling test has been substituted, which simplifies the giving of the examination and insures more comparable results without the loss of any of the selective value of the old spelling test.

3. The best scoring method for each test included in the general clerical examination has been found.

4. The relative selective values of the several tests have been more accurately determined and weights have been assigned accordingly.

5. A marked saving has been made in the work of scoring the papers.

6. The examination time has been reduced from five to two and one-half hours.

7. Advanced statistical methods have been applied to examination ratings which illustrate the practicability of employing (a) correlations to ascertain measures of relationship between examination scores and such factors as efficiency, education,

experience, and age; (b) regressions to predict the relative efficiency which may be expected from eligibles who make different test scores; and (c) percentiles to show the relative position of the test score of each competitor in relation to that of all other competitors.

IV

CONCLUSIONS

The evidence is clearly against the old methods of selection by chance, by hiring and firing, by personal opinion, by individual "hunches," by unstandardized examinations. There is no going backward for the employer and his employment manager who prefer the old ways. They will be eliminated.

With so much good in the important steps now being taken, it is to be regretted that there are some who claim

too much for what has been done. The vision of a future is still to be realized in hard, patient and persistent researches. The charlatan of tests has much easy money before him, for the "hard-headed business man" can call very few experts to his aid as yet. We can only recommend seeking careful, statistical proof of usefulness at each step taken.

Though difficult to make and requiring the expert at every step, the trade or proficiency test is simplest and most straight-forward in its implications. The general ability test, though highly important and practically useful, is a poor tool in the hands of the careless or untrained, and positively harmful without systematic records and statistical verification. The aptitude test is wholly in the research stage at present.

Fact and Fable in Character Analysis

By KNIGHT DUNLAP

THE practical need for methods of "sizing up" men—and women and children also, for that matter—and for doing it quickly, is so great that scientists and others long ago turned their attention to the devising of such methods. Many systems of estimation have been put forward.

Palmistry and phrenology are characteristic and well-known systems by which attempts have been made to estimate, in a rapid way, the character, temperament, physical stamina and mental abilities of individuals. Estimation based on the study of handwriting according to fixed rules has also had a wide vogue. Moreover, through the work of Lombroso and his studies of "criminal" man, the use of anatomical signs other than those of the hand and skull has been made familiar; the use of such signs, however, is of great antiquity.

In recent years, a number of systems of "character analysis" or personality analysis, based on the older theories, have had commercial importance, and of late there has been a considerable amount of rivalry between these systems. Books which print the essentials of these various systems have been widely circulated, usually as material for correspondence courses at high prices. Classes for instruction have been organized in many cities, often with the aid of churches which lend their rooms and in other ways have approved and advertised the classes and lectures. Indeed, several schools of fixed location exist for the training of "character analysts." From evidence along a number of lines, it can safely be in-

ferred that the "selling" of character analysis in various ways is at present a very profitable business.

Quite aside from these systems, the psychologists have been increasingly busy in the elaboration of "mental tests" for the estimation of what are sometimes called "intellectual" traits, and have achieved a substantial measure of success. Tests of "general intelligence,"¹ memory, attention, accuracy and various other "special" functions have been developed successfully. Tests of aptitude for specific lines of professional and technical work are well under way and work is being done towards the development of tests of emotional characteristics, which are so highly important. The psychologists have also made important contributions towards the development of tests for what are sometimes called "physiological" traits, such as the susceptibility to bodily fatigue and the ability to coördinate the musculature to useful ends.

THE PAINSTAKING METHODS OF PSYCHOLOGISTS

The work of the psychologist is slow, although sure, and proceeds by a method which makes no philosophical or biological assumption, namely, the method of finding out what the "reactor"—as we call the individual under test or examination—can actually do. In the application of a "mental test" or a "psychophysical test," we give the reactor a specific task, or a group

¹ General intelligence can best be described as the capacity to learn those things of most general use to civilized man.

of specific tasks, which have been painstakingly elaborated and carefully standardized. We then rate the reactor entirely by what he does, that is, by his measured performance in these tasks.

This method of careful scientific work is exasperating to many people. First, it is slow. It takes a long time to "measure" a reactor. You cannot "measure" him in a thoroughgoing way in a few minutes, even in regard to a single capacity. And many people, as we have said, want results quickly. Second, there is no single system of tests good for all purposes. Even for such a function as "general intelligence," the tests for children are not good for adults, and *vice versa*; the tests for literates cannot be applied for illiterates; and in general, each class of individuals, by social and educational standards, must have specific forms of test designed to fit that class. Further, tests of aptitude for any line of professional or technical work must be developed for that specific line and cannot be compiled hastily from stock tests. Third, mental tests, even after they have been constructed and standardized, cannot be applied and interpreted by the unskilled person. The acquisition of skill in mental testing is the work of years, not of weeks or months. Furthermore, skill in one line of mental measurement does not give skill in all others. A psychologist may be very proficient in technical or trade tests, but utterly unable to apply the Binet-Simon tests to a child; and many who are skilled in the testing of children for general intelligence are unskilled in other lines in which they have not worked.

THE DEMAND FOR SHORT CUTS

It is no wonder, then, that there has been impatience with the laborious method of science, and eager search

for short cuts and easy methods. Thus has arisen the field for the promoters of "character analysis," who propose to train, in a few weeks or months, an analyst to apply a single system which will cover the whole range of intellectual, emotional and other mental characteristics and permit an estimate to be made in a few minutes.

Systems of character analysis may be divided into two groups: (1) Those which base their estimates on physiological or psycho-physiological traits; (2) those which base their estimates primarily on anatomical traits. As an illustration of the first class, we may point to the systems based on handwriting. As an illustration of the second, phrenology and palmistry may be cited.

ASSUMPTIONS OF CHARACTER ANALYSTS

The phrenologist makes his judgment on the conformation of the skull. Modern systems based on phrenology, however, make use of other anatomical characteristics, such as the size and shape of the nose and of the ears, the color, size, placing and other characteristics of the eyes, the color and texture of the hair and the length of the finger. In so doing, these systems take their stand squarely in regard to two problems which are much discussed today by the scientific workers in genetics, namely, the problem of the importance of heredity as compared with training, and the problem of the linkage of mental and physical characteristics.

The anatomical features of the individual, it is well known, are determined almost entirely by heredity. Training has no effect on the shape and size of the nose, the shape of the ears, the form of the mouth, the color and curliness of the hair, or on any other gross

structural feature.² Even food influences these features but slightly. Climate, although it may bleach the hair and tan the skin, has little other effect on the structural characteristics. By depending exclusively on anatomical features, these schools of character analysis put their whole reliance on heredity.

Genetics has so far not been able to certify to any general linking of anatomical and mental characteristics in heredity, and therefore the second assumption of the anatomical character-analyst is still without the semblance of a foundation. An individual, for all we now know, may inherit his red hair through his father, but not inherit the fiery temper or mathematical genius his father possessed—and so on through the whole list of characteristics. Certain external structural details may be linked with certain mental characteristics, but we know of none such at present. The notion that the size of the head, or its shape, or even the size or conformation of the brain have definite relation to mentality, except in distinctly pathological cases, has long been exploded.

² The anatomical or structural features we are discussing here, and throughout, are the *external* and readily observable ones. They exclude the feature of muscular development through use (the biceps muscle, for example, changes in size and form, by use), which are classed as *physiological* rather than anatomical. The structure of the nervous system *may* be modified by learning, or training, aside from the determination effects of heredity. And we assume that there is a linkage between states of nervous mechanism and mental traits. But these neural conditions are not directly observable; they are only inferred.

The anatomical details on which systems of character analysis are based are of a quite different order, assumed to be directly observable, and controlled by heredity little influenced by environment or training. It is true, some character analysts have claimed that the shape of the bones of the face may be modified by the cultivation of mental traits, but such claims are too absurd to merit much attention.

RACIAL AND FAMILY CHARACTERISTICS

Popular fallacies on these points are due to confusions of conditions which have little bearing on our real problems, especially the confusion of racial resemblances and family resemblances, with more general facts of resemblance. Men of the same race resemble one another anatomically and have, presumably, somewhat the same mental characteristics. In the same family, sons frequently resemble fathers and grandfathers in feature and build, and with this anatomical resemblance frequently goes a similarity in mental characteristics and temperament.

Even up to this point, we are dealing with matters of very doubtful interpretation. There is danger today in overstressing the influence of physical heredity and minimizing the influences of training and other features of the environment. A Chinese, for example, whose mental characteristics have been supposed to be so different from those of the Anglo-Saxon, turns out after all to be very similar to him when brought up in the same sort of environment and under the same social influences. Similarly, a great deal of what has been supposed to be racial in mental characteristics is not intrinsically racial, but largely the effect of training. Indeed, some of the "inherited" mental traits in families are, perhaps, not matters of inheritance in the biological sense at all, but matters of environment. The father and son may have the same tastes and tempers because the son has acquired them from associating with his father during impressionable years, or from living in the environment established by his father.

The anatomical features of race and family, on the other hand, are matters of inheritance strictly, and changing the mental characteristics by modifying the training and environment does

not change the anatomical features in any important way.

There are undoubtedly some mental characteristics which are matters of inheritance and are very little modified by changes in environment and training. Feeble-mindedness and mathematical genius are examples of characteristics in which heredity is so important and environment so small in effect. And these are perhaps the characteristics for which there is the most striking lack of evidence of linkage to any discernible structural characteristics. In the same family, the son *may* resemble the father in both color of hair and mathematical genius, just as he may resemble him in both color of hair and shape of nose. But he may have the one characteristic and not the other in either case. And when we come to consider individuals in unrelated families of European races, we find no evidence for the occurrence of any specific anatomical feature with any specific mental characteristic.

In regard to racial characteristics, where such exist, we may expect to find a considerable degree of apparent linkage of anatomical and mental characteristics. If all members of a certain race have a certain hair color and all members have a certain mental trait, then, of course, that hair color and that mental trait appear to be linked in that race. If only a certain percentage of the race have the hair color and a certain percentage have the mental trait, the probability of any individual who has the hair color having the mental trait can be worked out mathematically, but in no particular case can the inference from physical trait to mental trait be surely made.

In these cases, we use the anatomical indication to determine that the individual belongs to a certain race and then, on the basis of his race, we esti-

mate the probability of his possessing a certain characteristic in a certain degree. But when we are dealing with races, like the European, in which there is wide variation in anatomical features and wide variation in the various mental traits, we have so far discovered no uniform linkages of anatomical detail and mental characteristics.

If we observe mathematicians of eminence, for example, we apparently find that all types of eyes, ears, mouths, hair and of other body details are represented. And if we observe any type of nose, we find it possessed by historians, mathematicians, lawyers and men of every other class, of all degrees of ability. It is possessed by feeble-minded individuals as well. The same is probably true of any other feature. At least, no one has yet shown by scientifically valid evidence that any body detail is linked with any mental character.

ANATOMICAL CHARACTER ANALYSIS WITHOUT SCIENTIFIC FOUNDATION

The various systems of anatomical character analysis cannot be considered as having any established bases in fact. The very diversity of such systems would in itself lead us to suspect this to be true, even if the survey of our present knowledge of genetics did not lead to the conclusion. But, of course, we cannot say that there is not some linkage of mental and anatomical traits hitherto undemonstrated. A scientific investigation of possible linkages would be well worth while, even if it should lead to a negative conclusion. But such an investigation has not even been begun, so far as the writer can find, except by Lombroso and his school, and their work has not been successful. The casual observations of cases in which the association of mental and anatomi-

cal characteristics agrees with the arbitrary scheme of this or that system of character analysis cannot be scientifically credited, any more than can similar observations in other fields. Such observations have been the bane of medicine, not only in the mental but also in the strictly physiological fields, and have led to the application of many nostrums.

The scientific study of the correlation of mental and anatomical traits would have to be carried out with the same scientific rigor which has marked the development of mental tests. Thousands of accurate measurements would have to be made and expressed in a definite numerical way, for valid statistical treatment. The measurements on even a single feature, such as the nose, would need to be very complicated—so complicated and exact that from the measurements of any specimen one could accurately reconstruct the exact nose in wax or clay. From measurements of a thousand or more noses of mathematicians (or musicians, or poets, or whatever class might be at the time under investigation), together with accurate estimates of the proficiency of the individuals in the selected line, one might determine the correlation of the mental ability with this or that detail of nose form. But even this one task would probably require several years of labor on the part of investigators who were expert both in mental measurements and anthropometry. Prior to the acquisition of such data, the hasty construction of norms is nothing less than absurd.

GRAPHIC SYSTEMS OF CHARACTER ANALYSIS

Returning now to the other types of character analysis, based on physiological or psycho-physiological traits, we may consider first the graphic systems which we have indicated as

typical. In seeking for a correlation between details of handwriting and mental traits, we should be making no assumption whatever in the field of heredity or genetics. An individual writes in a certain way, determined by his heredity and training conjointly, but for our purposes the relative efficacy of these two factors is unimportant. It might be true that all *significant* characteristics of handwriting vary with training alone, that is to say, that all individual differences which are used in the systems of analysis to be constructed are due to differences in individual training—which we have seen is *not* true of anatomical differences. However, this would be unimportant for our purposes; we still might find a correlation between performance in handwriting and mental performance.

Handwriting is a record of actual performance and the problem involved in considering it as a basis for character analysis turns upon the question whether there are traits in this performance which are associated with traits in other important mental performances of the reactor. While such correlations have not surely been made out, there is so far no reason to believe that they do not exist, or that they may not be discovered. Hence, research in this direction and in the direction of other performances and records of performances, is much more promising than is research along the anatomical lines previously discussed.

EXPRESSIVE MOVEMENTS AND CHARACTER READING

In the same class with writing performance is movement in general: movement of the hands and arms in various ways; movement of the legs in walking; postures of the whole body; facial expressions, and especially movement of the complicated vocal appara-

tus in speaking. The interesting and promising feature of all these movements is, that they are *expressive*. They do vary with the emotional attitudes and processes of the reactor, and they are also associated with ideational processes. The important question is whether, in addition to evidence concerning transitory mental processes—and they furnish the only evidence we have of these—they also may give us evidence concerning *tendencies* and *habits* of mental process. Our indications in this direction are somewhat encouraging.

Not only do emotional and ideational processes tend to follow lines of habits, but expressive actions have the same tendency. A habit of expression, therefore, is frequently an index of a mental habit. And many habits of action are really habits of expression. Some actions tend very strongly to follow habitual lines. Thus, an individual can often be recognized at a considerable distance by his manner of walking, because he uniformly walks in a habitual manner. So with given types of movement of the arms, head and facial muscles, and types of speech—these tend to be habits. In observing or recording types of movement, therefore, it is possible, if the observations or measurements are sufficiently extensive, to determine whether certain characteristics of the movement are temporary variations, due to immediate factors in the environment, or are habitual, and therefore are individual characteristics. Furthermore, some types of movement leave their records. This is true of certain facial expressions, as in smiling, frowning and sneering. The use of the facial muscles in habitual ways eventually draws the tissues into definite forms or patterns which are not strictly anatomical, but which are physiological records. These sets are

not easy to differentiate from anatomical configurations, but the differentiation can be made in some cases.

The scientific analysis of expressive movements has not progressed far. Perhaps more work has been done on handwriting than on any other expression, but nothing has so far come out of it which is capable of practical application in the way of character analysis. Intensive work on children's drawings has been begun in the last few years and promises much. Facial expression has been studied by a number of investigators in the past, but only in a superficial way. Detailed study by scientific methods has just been commenced. So far only methods have been perfected; the detailed results are yet to come. In these and other lines of expression, the practical results and applications are so far only rough, and in the field of pathology, physical and mental. Facial expression and movements and positions of various sorts characteristic of various diseases, have been roughly identified, but give us nothing to apply to the character analysis of normal individuals. The problem must be attacked by the laborious methods of science. Even on the stage, where the correlation of expression and mental state is of paramount importance, the art, and not the science, of expression has been developed, and the stage would undoubtedly benefit greatly by the results of the psychologist's serious study of the problems.

IDENTIFICATION OF ACTION PATTERNS

In spite of our lack of scientific information, we do constantly make use of our observation of expressive movements, and their records, not only for the identification of the emotion or idea of the movement, but also for a rough sort of character analysis. We decide that an individual is rude,

kindly, intelligent, deceitful, in his general characteristics, by the expression of his face, vocal organs and other movements and attitudes. We make our decisions with varying degrees of accuracy, and we make them, if we attain any efficiency at all, entirely on the basis of the expressions and their records, although we do not analyze these expressions and, if we do attempt to analyze, usually go wrong.

Our practice in this rough "character analysis" is but one instance of a much wider practice. One may recognize a place, on returning to it again and yet not be able to identify a single detailed feature of the place. One may recognize a person, whom one is totally unable to describe. One recognizes a friend at a distance of two blocks and yet cannot say what the precise difference is between his walk and the walk of some one else. One may know that the person he is talking to is pleased, but not be able to identify a single facial or vocal change which gives the clue. In other words, in practical life, our reactions and our judgments are largely to *patterns*, that is, total situations. We react differently to patterns which differ and judge them differently without knowing, or needing to know, *how* they differ.

But, although we may attain a certain efficiency in this way, there are situations in which analysis is of very great use, and character analysis presents such a situation. It would be of very great assistance if we had knowledge in detail of the exact correlation of elements of expression, or definitely describable patterns of expression and record, which indicate

specific mental traits. It is highly desirable that research in these directions should go forward.

CHARACTER ANALYSIS VERSUS PSYCHOLOGIC TESTS

In the meantime, we have no valid systems of "character analysis" which can be reduced to rules, formulae, or written specifications. Such a system may sometime be developed—no one can predict with assurance that it can or will be—and if it is developed, it will undoubtedly be developed on a physiological, not an anatomical basis. For the present, we must beware of "systems," for no system offered at present is anything more than a wild guess, without evidence of validity. Those who "successfully" use such systems—and the actual measure of "success" is probably not great in any case—undoubtedly make their actual estimates as all the rest of us do, by "general impression" without analysis. They then make their interpretations from their systems agree with this estimate. This procedure accounts for the fact that of the various conflicting "systems," any one "works" as well as any other. The man of experience in judging men, who does not attempt to analyze the details by which he judges, will do much better than if he hampers himself with a fantastical "system." But, at present, he will do still better if he makes use, whenever possible, of the measurements and tests which the psychologists have developed for the actual determination of mental characteristics by the measurement of performance in these characteristics, without reference to "signs," either anatomical or physiological.

Methods of Rating Human Qualities¹

By DONALD G. PATERSON

THE so-called psychological method of rating human qualities is designed to remedy the defects inherent in the traditional method of sizing up people. From time immemorial employers have been forced by the very nature of things to form some impression of the worth of workers. This task has been performed so automatically and habitually that, until recently, it has not been subject to critical examination and study.

Of course, all of the estimating is not automatic. A valued employee quits and the employer immediately begins to consider the question of promoting some worker to the position left vacant. The employer comes to realize that he does not know all the facts about all the employees and so he calls in one or two of his foremen and asks them for their opinions concerning Tom, Dick or Harry who might possibly step into the vacant position. The foremen, suddenly confronted with the demand for an opinion, hastily rack their brains for instances that would show whether or not Harry is better fitted than Tom for the job. On the basis of some recent incident in which Tom has pleased the foreman or displeased the foreman we find that Tom is either enthusiasti-

cally recommended or is disparaged. The emergency having arisen, our friend Mr. Employer is forced to depend upon the "emergency opinions" of those around him and hence he meets the situation more or less inadequately on the basis of snap judgment. So Tom is promoted and—promptly forgotten; that is, until another emergency arises. This in brief gives us the high lights of the traditional method of judging the value of a worker.

The inadequacy of the traditional method is self-evident when one begins to give any thought at all to the matter. Since a number of employers and psychologists have been studying the situation during the past ten years, it is natural that we should witness attempts here and there to overcome the defects in the traditional method. These attempts have now become numerous and a complete account of all of them would be exceedingly lengthy. A brief sketch of the more important results therefore, will be sufficient to indicate recent progress, present practice and the outlook for the immediate future.

This recent work may be thought of as the application of scientific psychological methods to the problem of securing more accurate estimates of the worth of employees. The result is the development of better methods of estimating or rating employees. In short, we now have a technique known as the rating scale method. This technique is characterized by twelve principles generally accepted as a sound advance over the traditional snap judgment or impressionistic method of judging or misjudging human qualities.

¹ The writer wishes to acknowledge in this way his heavy indebtedness to his former colleagues in The Scott Company, Consultants in Industrial Personnel, for much of the material contained in this paper. His indebtedness is indicated only in part by the frequent reference to a paper on "The Scott Company Graphic Rating Scale," which he was privileged to prepare for publication. Grateful acknowledgment is also made of the kindness of the Editor of the *Journal of Personnel Research* in permitting the reproduction of the sample graphic rating scale which first appeared in that journal.

TWELVE PRINCIPLES OF PSYCHOLOGICAL RATINGS

1. Records concerning supervisors' estimates of subordinates should be accumulated and filed in *advance* of any emergency requiring such estimates as a basis of decision.

2. Estimates should be based on qualities that are defined unambiguously in advance.

3. Qualities to be rated should be defined in objective terms so far as possible and should be grouped according to the accuracy with which they can be judged.

4. Each quality to be rated should refer to one type of activity carried on or to one type of result achieved by those to be rated.

5. Ratings should be confined to past or present accomplishments.

6. The list of qualities to be rated must be related directly to the type of work performed by those to be rated.

7. The method of recording one's ratings should be easily understood and easily complied with.

8. Estimates should be expressed in a uniform manner by all raters.

9. A statistical method of correcting for the tendency to rate "too high" or "too low" should be employed.

10. Ratings should be accepted and filed for use only from those who have proved themselves capable of accurately judging human qualities.

11. Each executive should rate his subordinates on the first quality, then, rearranging the order at random, he should rate them on the second quality and so on for the remaining qualities.

12. As many judges as possible should be employed in rating a given person and an average of all the available ratings should be used as the index for that person.

The bare statement of the principles to be followed in the construction, introduction and operation of a sound rating technique may seem dogmatic, or may seem to be too abstract, academic or technical to those who have not had actual experience in developing and utilizing the most advanced methods of rating human qualities. However, the widespread use of more or less complicated and systematic rating schemes in business and industry warrants in this place a fairly extended discussion of these principles. Those responsible for such schemes should realize the difficulties and thereby avoid the many serious sources of error involved in any rating scheme.

DISCUSSION OF THE TWELVE PRINCIPLES

Principle 1. The philosophy underlying standardized subjective judgments, with which we are here concerned, hinges on this principle. Business or industry needs some method of evaluating employes in those cases where comparable and accurate production records or trade test scores and other objective test scores are not available or possible. Furthermore, it is evident that the accumulation of the ratings for each employe will give to management a partial basis for making an estimate of the worth and future possibilities of any employe in *advance* of any emergency demanding such an estimate. It is obvious that supervisor's opinions, systematically and periodically made, will at least be freer from the bias and inaccuracy occasioned by some sudden demand for an opinion in the face of an emergency.

Principle 2. It is even more important for a supervisor's opinions to be based on qualities that have previously been defined and agreed upon. Under the ordinary haphazard con-

ditions prevailing in the absence of a rating scheme, we find each supervisor estimating employes on the basis of widely divergent qualities. One supervisor will base his estimate mainly on the appearance the employe makes, whereas another supervisor will base his estimate largely on the previous business or industrial experience of the employe. The variations possible are endless. It is, therefore, very advantageous to have all those who supervise a given class or type of worker agree in advance concerning the essential qualities. This agreement should extend not only to the listing of the essential qualities but also to the defining of each of those qualities. In this way there is a greater probability of having the various estimates conform to the same standards of judgment. Unnecessary disagreements and perplexing differences of opinion are in this way reduced to a minimum.

Principle 3. In defining the qualities agreed upon, care should be taken to describe them as objectively as possible. In addition the qualities themselves should be classified according to their degree of objectivity. Hollingworth (A¹, pp. 80-81) has defined objective qualities as those that "represent reactions to objects and impersonal situations and tasks." He lists "efficiency," "originality," "perseverance," and "quickness" as objective qualities and points out that experimental results show much greater consistency or agreement among judges in rating the same people in these qualities than when the ratings are confined to subjective qualities. The subjective qualities are defined as those that "represent reactions to the presence and character of other persons" such as "courage," "cheerfulness," and

"kindliness." Experimental results indicate that these qualities are judged quite inaccurately, *i.e.*, two judges will tend to disagree greatly in rating the same persons. Not only do qualities themselves differ in objectivity but the same quality can be defined objectively or subjectively. For example, let us compare two definitions of a quality all would agree an executive should possess:

Subjective definition: Leadership:
Rate this executive's initiative, force, self-reliance, decisiveness, tact, ability to inspire men and to command their obedience, loyalty and coöperation.

Objective definition: Leadership:
Rate this executive according to the success he has shown in developing a loyal and effective organization by administering justice, inspiring confidence and winning the coöperation of his subordinates.

The subjective definition draws attention to more or less intangible elements of an executive's personality, *i.e.*, force, self-reliance, decisiveness, tact, etc. The more objective definition aims to confine attention to the loyalty and effectiveness of the executive's subordinates, this being considered the final acid test of leadership.

One other example should be sufficient to make the distinction clear. Take such a quality as appearance. I have a rating scale before me that defines appearance as "personal attractiveness, cleanliness, neatness, dress." This quality is more objectively defined in another rating scale in which the rater is asked to "consider how favorably he impresses his men by his physique, bearing, and manner." This second definition endeavors to prevent the rater from recording his own impression of the appearance of the one being rated. On the other hand, it tries to have the

¹ Letters in parentheses refer to titles listed at the end of this article.

rater judge from the standpoint of how the person's appearance affects others.

We may say, then, that objective qualities should be selected as far as possible, that they be arranged in groups according to their objectivity (greater weight being given to the ratings on the most objective qualities and less and less weight to the more subjective qualities), and finally that they be defined in objective terms, *i.e.*, in terms of results achieved rather than in terms of personal characteristics.

Principle 4. By confining each quality to be rated to one type of activity carried on or to one type of result achieved by those to be rated, we make definite the meaning of the rating in each quality. Many rating scales fail to confine each quality to one type of activity and thereby violate this principle. To cite an example, reference is here made to the scale used in the rating of officers in the United States Army during the World War. Quality I in this scale is entitled "Physical Qualities" and is defined as "Physique, bearing, neatness, voice, energy and endurance." Quality IV is labelled "Personal Qualities" and is defined as "Industry, dependability, loyalty, readiness to shoulder responsibility for his own acts, freedom from conceit and selfishness, readiness and ability to coöperate" (B, p. 567). It is obvious that ratings on qualities that refer to heterogeneous, complex and *unrelated* activities under one head must necessarily be difficult to interpret. By way of contrast a definition of "Industry" that is included in The Scott Company's Graphic Scale for Workers is presented. "Industry: Consider his energy and application to the duties of his job day in and day out."

Principle 5. Ratings should be confined to past and present accom-

plishments. The qualities to be rated should cover what the supervisor knows the employe has done rather than what the supervisor thinks he is capable of doing. Ratings should be records of things as they are rather than guesses as to the future. In other words, judgment as to the future possibilities of the person rated should be an independent act divorced from the ratings. Management's decisions concerning the future possibilities of an employe must be made, but they can best be made on the basis of *all* the available information about that employe. Ratings concerning that employe as he is should, of course, be included and taken into consideration along with all other pertinent facts.

Principle 6. The list of qualities to be rated must be related directly to the type of work performed by those to be rated. This is true because, after all, management is not interested in estimates concerning abstract qualities possessed by a worker that may or may not have anything to do with his value as a worker. It is also true because most of us have deluded ourselves into thinking that industry, initiative, etc., are constant traits that are exhibited by different individuals in absolute amounts on any or all occasions. A moment's reflection convinces us that such traits or qualities are strictly relative and variable. A given person may show initiative in doing one kind of work and lack initiative in another. One may be exceedingly energetic and industrious in collecting stamps or butterflies and yet be lazy and lethargic in sweeping a floor. An excellent discussion of this important fact, which is overlooked all too frequently by those whose business should make them careful analyzers of human beings, is given by Link (C, pp. 256-258).

The principle derived from these considerations necessarily means that

we can never hope for any general rating scale having universal application and validity. We must have scales for various types and classes of workers. These different scales will contain in some instances radically different qualities. For example, a rating scale for salesmen might well include the quality "sales ingenuity," whereas a rating scale for bank employees would not. A scale for bank employees, on the other hand, would probably include the quality "Reliability in handling money," whereas such a quality would be out of place in a scale for factory workers. Different scales, in other instances, will contain the same quality defined in radically different ways. For example, the quality "initiative" is contained in a rating scale for executives and in a rating scale for workers, but defined in the following two ways. "Consider his success in doing things in new and better ways and in adapting improved methods to his own work" is the definition in the scale for executives, whereas "Consider his success in going ahead with a job without being told every detail; his ability to make practical suggestions for doing things in a new and better way" is the definition in the worker's scale (D, pp. 362 and 364).

To avoid the pitfalls resulting from the variability and lack of universal significance of abstract qualities, it is necessary to make a careful job analysis of the work being done by the group for whom a rating scale is being developed. It is necessary to block out types of behavior, ranging from high to low in terms of significance or general value in the particular work considered. The qualities must be important. They must indicate the employe's accomplishments on the job at the time he is being rated.

There is no easy, royal road to success in rating scale construction. The

situation calls for technical expertness and the industrial psychologist needs to be available for consultation in such job and human analysis work. With this in mind it is little wonder that so many rating scales in use in industry are not only inaccurate but misleading. Too many busy executives, enthused over the possibilities of a rating scale, have committed the scientific sin of dashing off a rating scale with the left hand while their right hand carried on their customary duties and responsibilities. The point is clear—rating scale construction is not something to be done in a moment of enthusiasm amidst other pressing duties. It requires time, care, and expert judgment based on adequate industrial and psychological training.

Principle 7. The method of recording one's ratings should be easily understood and easily complied with. The reason is simple,—if the method is difficult to understand or is time-consuming and cumbersome your busy executive will not hand in carefully expressed estimates of his subordinates. This proved to be the chief drawback of Walter Dill Scott's ingenious man-to-man comparison scale both when it was used in the army and in industry. The relative ease or difficulty of the various rating methods so far devised will be discussed in connection with a consideration of the next principle.

Principle 8. Estimates should be expressed in a uniform manner by all raters. This refers not to the matter of uniformity of qualities and definitions, but to the uniformity with which different supervisors express the degrees of excellence in the various qualities.

The rating schemes that have been developed and adopted most generally are simple enough, but they are subject to grave errors. The following is typical of such schemes:

NAME OF WORKER	QUALITIES TO BE RATED						
	Dependa- bility	Intelli- gence	Industri- ousness	Neatness	Cheerful- ness	Activity	Total or Average
	1	2	3	4	5	6	
1. John Doe							
2. Jim Smith							
3. Henry Black							
4. Irving Slack							
5. etc.							

The rating executive is instructed to indicate his ratings for each quality opposite each name by inserting a percentage or a number from 1 to 10, or by inserting a letter from A to E or an adjective such as "Excellent," "Fair," "Poor," etc. All of these symbols are open to a common serious criticism, to wit, rating executives frequently have preconceived notions of the values of numbers, percentages or letters. One executive will consider 60 per cent as the "passing mark" (a curious fallacy to which countless educators are addicted), while another executive may have the same preconceived notion regarding 70 per cent or 75 per cent, or some other hypothetical percentage deadline. A worker rated 68 per cent by the first executive will really be a better worker than a worker rated 69 per cent by the second executive. A startling experiment will illustrate the lack of meaning that is to be attributed to any particular percentage mark. D. Starch (E, pp. 254-259) duplicated a typical geometry examination paper and sent it to 116 competent teachers of mathematics in 116 high schools in the North Central Association of Secondary Schools with the request that each mark the paper on the basis

of a percentage scale extending from 0 to 100. Lo and behold, the marks for this same paper ranged all the way from 28 per cent to 92 per cent! Half of the teachers gave the paper a mark of 70 per cent or better, whereas the other half gave the paper a mark of less than 70 per cent. This illustrates forcibly and clearly the variation in subjective ratings when such ratings are expressed in a poorly defined, vague and abstract percentage scale. The same thing is true when we resort to the expression of estimates in numbers from 1 to 10, in letters from A to E, or in adjectives such as "Good," "Fair," "Poor," etc. This defect is contained in most rating schemes now in use and seriously impairs their accuracy and consequently their usefulness.

Psychologists have developed three types of rating scale designed to overcome this defect. The first and most widely known is Walter Dill Scott's "man-to-man" comparison scales for each quality. Each step on the scale is represented by some actual person known to the rating executive. For example, a given rating executive's "master scale" for Quality I would look like this:

Physical Qualities:

Highest.....	J. Smith.....	15
High.....	E. Jones.....	12
Middle.....	R. Black.....	9
Low.....	A. Anderson.....	6
Lowest.....	E. George.....	3

This means that this rating executive considers J. Smith to be the most perfect man he knows as far as physical qualities are concerned, whereas he considers E. George to be the poorest and the others to range in between. Having made out his "master scale" he then proceeds to rate his subordinate B. Richards and compares Richards with each man on his "master scale." If he decides that Richards is physically superior to R. Black but inferior to E. Jones he would then give Richards a rating of 10 or 11 in Physical Qualities. This novel method constitutes a marked improvement over the ordinary rating scale previously described because it gives a concrete standard of comparison in terms of real men of differing degrees of ability known intimately by the rating executive who has himself constructed his own "master scale." An extensive investigation by Rugg (F) revealed the fact that it failed to work very well in actual practice because rating executives were reluctant to devote the necessary time for the construction of an accurate "master scale," or were prone to rate subordinates numerically without actually producing their "master scales" and consulting them carefully before each rating was made. In other words the method proved to be too time-consuming, cumbersome, and difficult to understand for the average rating executive. The Scott Company in its first work in industry made a thorough trial of this rating method, but soon abandoned it in favor of a more simple and accurate method (D, p. 361).

The second type of scale designed to

bring about greater uniformity among different rating executives in expressing their estimates is known as Miner's Quintile Rating Method (G, pp. 123-133). As stated by Miner, the main features are: (1) The person is rated relative to the members of a defined group which is known by the judge and is used as a standard; (2) all qualitative terms are avoided since it is impossible to define them so that they call up the same idea in the minds of different judges; (3) the method allows the discrimination to be made as finely as the judge desires; (4) the units of measurement may be readily transmuted into equivalent variability units. The scale which was drawn up for senior students in the Carnegie Institute of Technology, and was to be used by the employment office in recommending students for positions, is shown on the following page.

The blank is self-explanatory. Its successful use in industry would presuppose that rating executives may be readily taught to think in terms of the normal probability curve with its divisions into fifths, and also hold in mind the concept of the total range of ability defined as the standard of comparison. It would seem unreasonable to expect busy executives to do this properly and accurately because, after all, the divisions in fifths are largely imaginary and would not have the same meaning for different executives.

A simpler method and one that makes much less demand on the rating executive's ability to think of abstract ranges of ability is typified by the Scott Company's Graphic Rating Method (D). Figures 1 and 2 reproduce the two sides of one of these rating scales for workers.²

² These figures are reproduced by permission of the Journal of Personnel Research.

MINER'S RATING BLANK

Will you please rate the student named below for the traits indicated. Place a dot along the line after each trait, grading the student as finely as you care to.

Name of Student. *Jones, John.* Instructor.....

Among the members of the average senior class in this student's course and school, the student would rank in the

	LOWEST 5TH	FOURTH 5TH	MIDDLE 5TH AVERAGE	SECOND 5TH	HIGHEST 5TH
Common Sense					
Energy					
Initiative					
Leadership					
Reliability					
General Ability					

Inspection of this sample scale brings out clearly the two main features: "The one doing the rating is freed from *quantitative* terms in indicating his opinion of the subordinate in any quality, for he simply records his opinion by making a check mark on the line following a defined quality or ability. He is guided in this by short descriptive adjectives that define the various degrees of excellence in that quality. Furthermore, the rating executive is not forced to place a subordinate in one of several classes, but may put his check mark anywhere on the line. This means that he may make as fine a discrimination of merit as he chooses. It is also important to note that the rating executive himself is not burdened with the task of summing up his ratings. This work is clerical in nature and is economically performed by clerks in the personnel department.

"The steps involved in summing the ratings and in evaluating the ratings for use on permanent record cards is as

follows: A stencil or scale divided into ten divisions, each numbered from 1 to 10, is provided for converting the various check marks into numerical scores. The directions printed on this scoring stencil are: Place the stencil so that the scale coincides with the line for Quality 1. Note in which of the ten scale divisions the check mark falls. Enter this number in the column at the right of the line. Proceed similarly to score the report for Qualities II, III, IV, V, VI and VII. Add the seven numbers you have entered in the column at the right of the report lines and enter this sum after the word 'Total' in the lower right-hand corner of the report sheet" (D, p. 365).

The experimental trial of the graphic rating method demonstrated that the ratings are highly reliable and that the method is simple and practicable in actual use.

Principle 9. A statistical method of correcting for the tendency to rate "too high" or "too low" should be

(SCALE B)

GRAPHIC RATING REPORT ON WORKERS

Name of Employee _____ Branch _____
 Position of Employee _____ Department _____
 Employee Rated By _____ Date _____

Instructions for Making Out This Report:—Rate this employee on the basis of the actual work he is now doing. Before attempting to report on this employee, it is necessary to have clearly in mind the exact qualities which are to be reported on. Read the definitions very carefully. In each quality compare this employee with others in the same occupation in this company or elsewhere. Place a check (✓) somewhere on the line running from "very high" to "very low" to indicate this employee's standing in each quality. It is not necessary to put the check (✓) directly above any of the descriptive adjectives.

QUALITIES	REPORT				
I. Ability to Learn: Consider the ease with which this employee is able to learn new methods and to follow directions given him.	Very Superior	Learns With Ease	Ordinary	Slow To Learn	Dull
II. Quantity of Work: Consider the amount of work accomplished and the promptness with which work is completed.	Unusually High Output	Satisfactory Output		Limited Output	Unsatisfactory Output
III. Quality of Work: Consider the neatness and accuracy of his work and his ability constantly to turn out work that is up to standard.	Highest Quality	Good Quality		Careless	Makes Many Errors
IV. Industry: Consider his energy and application to the duties of his job day in and day out.	Very Energetic	Industrious		Indifferent	Lazy
V. Initiative: Consider his success in going ahead with a job without being told every detail; his ability to make practical suggestions for doing things in a new and better way.	Very Original	Resourceful	Occasionally Suggests	Routine Worker	Needs Constant Supervision
VI. Co-operativeness: Consider his success in effectively co-operating with his co-workers and with those exercising greater authority.	Highly Co-operative	Co-operative		Difficult to Handle	Obstructionist
VII. Knowledge of Work: Consider present knowledge of job and of work related to it.	Complete	Well Informed	Moderate	Meagre	Lacking
REMARKS: (See Reverse Side for Suggestions) _____					Total _____
					Final Rating _____

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FIG. 1. FRONT SIDE OF ONE OF THE RATING SCALES FOR FACTORY WORKERS

employed. These "constant tendencies" exhibited by different rating executives are extremely common. Indeed they are so common that one can safely predict that most rating

schemes now in use are made well-nigh worthless through failure to recognize the existence of such an error and to circumvent it by the adoption of a suitable statistical method of correction.

(SCALE B)

GRAPHIC RATING REPORT ON WORKERS

The Purpose of Periodic Rating Reports

1. The graphic rating report is a practical method by means of which each employe's ability and fitness for promotion can be known quickly, with a reasonable degree of accuracy and with uniformity throughout the company.

2. The ratings are converted into a numerical expression indicating the ability of each person in those qualities deemed most essential, such as ability to learn new methods, quantity of work, quality of work, industry, initiative, co-operativeness, and knowledge of work.

3. Because the Rating Report calls attention separately to each of these essential qualifications, it lessens the danger that opinions will be based on minor points, with a corresponding disregard of important qualities. It is to the interest of all concerned to replace snap judgments by carefully thought-out reports.

4. This rating report has been devised after careful consideration of the best practices throughout the country. Its chief claim for the support of the supervisor and the employe is the fact that it is simple, concrete and definite. It reduces the time required to rate an employe to a minimum, yet it is so arranged that the interests of each employe are safeguarded as regards accuracy and fairness.

5. All rating reports are confidential. Any employe who is rated, however, may be told where he stands in order that he may improve himself if he so desires.

To Supervisors: Supplement Your Rating With Appropriate Remarks

When you have completed your rating of the employe on the front of this report, enter under REMARKS any comments which are appropriate.

In doing so, consider the possible comments suggested here and write the numbers of any comments that are particularly pertinent.

1. Recommend that Personnel Department interview this employe to advise him

(a) How he can improve himself.

(b) Concerning his present and future opportunities.

2. Deserves promotion.

3. Desires transfer to other work.

4. Well liked by fellow-employees.

5. Would do well in a supervisory position.

6. Is handicapped physically as follows.....

7. Is taking a course in.....

FIG. 2. REVERSE SIDE OF ONE OF THE RATING SCALES FOR WORKERS

A quotation will indicate the seriousness of this error in the case of one large company: "The writer can cite the costly experience of a very large organization as an example of the necessity for such statistical treatment. This company had built up a large file of ratings on their salesmen who were scattered throughout the United States. The sales manager was preparing to 'scrap' all of the results and prepare a new rating scale on the assumption that the particular rating scale in use was responsible for the worthlessness of the ratings that had been accumulated at great expense. When asked what

was wrong he said that they could not safely use the ratings for they knew that all of their salesmen in Atlanta, Georgia, could not be poorer than all of their salesmen in St. Louis, yet that was what the ratings revealed. He had failed to see that the error was due to a serious difference in the rating standards of his sales manager in Atlanta and his sales manager in St. Louis. It was obvious that a statistical method that would reduce the rating standards of the Atlanta and St. Louis managers to a common basis would have done much to increase the accuracy and usability of these ratings

filed in the central office at headquarters" (D, p. 374).

The difference between rating executives in rating tendency, even when those rating executives were rating precisely the same workers, has been experimentally demonstrated, and the results are given in the article on the graphic rating method (D, pp. 372-374). These differences are largely due to differences in standards of judgment exhibited by different rating executives and show clearly the need for reducing all ratings to a common basis. The method of doing this is described in the following quotation: "These 'Total Ratings' are never used, but are converted into Final Ratings by the following procedure: The reports made by a given supervisor or foreman are assembled and the 'total scores' are arranged in a frequency distribution from high to low. This distribution is then divided into five parts so that the highest 10 per cent of the Total Scores are given a Final Letter Rating of A, the next 20 per cent are given a Final Letter Rating of B, the next 40 per cent are given a C rating, the next 20 per cent are given D and the lowest 10 per cent are given E. The limiting points in Total Scores are noted and a 'Key to Final Ratings' is prepared whereby future ratings made by this supervisor may readily be converted into Final Ratings. This procedure converts the actual ratings into relative ratings and is designed to do away with the error which otherwise arises because some supervisors rate too high and other supervisors rate too low" (D, p. 365).

Principle 10. Ratings should be accepted and filed for use only from those who have proved themselves capable of accurately judging human qualities. This means that a rating scheme will not work automatically. It must be closely supervised, prefer-

ably by trained personnel research workers who must continually subject the ratings to critical analysis and assist in training executives in a proper use of the method. There is no escape from this requirement. Hollingworth has shown over and over again how people differ with respect to their ability to judge others. (A. See chapters 2, 3, 4, 5 and 6). The article on the graphic rating method also contains actual data tending to show that some foremen are extremely unreliable in their judgments of their subordinates (D, p. 369). Kingsbury's careful work in supervising an elaborate study of ratings in a large national bank bears witness to the same need (H, pp. 377-383). The technical procedure for safeguarding the rating procedure in actual use is adequately described in the two articles mentioned and is therefore omitted from this paper.

Principle 11. Each rater should be forced to rate all of his subordinates on one quality at a time. This is true for two reasons: In the first place, the ratings on various qualities given to a particular worker are frequently too high or too low because he who judges may be unduly influenced by some one outstanding virtue or defect possessed by that worker. Thorndike has presented us with an excellent discussion of this tendency to error and has given it the title of "halo" (I, pp. 25-29). Kingsbury also discusses this error and recommends that the rating of all subordinates on one quality at a time be adopted as the standard procedure in order to minimize this error (H, p. 380). In the second place, there may be a tendency to change one's standards of judgment during the process of rating a group of subordinates (H, p. 381). The error introduced by this tendency may be avoided in part by forcing each rater to rate his sub-

ordinates one quality at a time, arranging his subordinates in a random order prior to rating on each quality.

Principle 12. As many judges as possible should be employed in rating a given person and an average of all the available ratings should be used as the index for that person. The unreliability of a single judge has been emphasized over and over again by all those who have experimentally studied the ability to judge human qualities in others. The reader is referred to the work of Rugg, Hollingworth and Miner already referred to for ample demonstration of the soundness of this principle.

Our extended discussion of the foregoing principles leads us to view methods of rating human qualities as a technical problem in applied psychology. Psychologists have approached the problem by the experimental method with the result that executives in business may utilize the best available methods for increasing the reliability of the judgments of men that are constantly being made wherever human beings are thrown into contact with one another. Being a technical problem, with many pitfalls to avoid, it is certain that the executive who attempts to utilize these psychological methods, in the absence of a thorough mastery of the principles and technique involved, is doomed to disappointment and failure in his use of these methods if he hopes thereby to set up a reliable rating scheme.

These rating methods should not be looked upon as perfect or as final. Further research is necessary and industry will profit just as rapidly as progressive, experimentally minded executives realize the scope of the problem and engage in the necessary research to construct adequate scales, to administer and operate rating schemes as reliable as our present knowledge

will make them and to develop newer and more reliable methods than we now possess.

PURPOSES OF RATING SCALES AND METHODS

This entire discussion has centered around the present status of methods of rating human qualities. In closing it might be well to point out the purposes of rating methods in business and industry and in this way indicate the importance of the whole topic. This can best be done by quoting a section of the experimental report already referred to many times in this paper: "These purposes may best be outlined in terms of three factors that have brought about the development of rating methods as one of the tools of personnel administration:

"I. Rating methods have been developed because of a recognition of the *educational value of ratings* from the following points of view:

"a. The educational effect on those who make the ratings. Making out the rating reports insures the analysis of subordinates in terms of the traits essential for success in the work.

"b. The educational effect on the employe. The knowledge that he is being judged periodically in essential traits affords him knowledge of those things that are considered vital and important, encourages self-analysis and provides an incentive for self-improvement in those traits in which he is weakest.

"II. The development of rating methods has also been due to a realization of the need of bringing about a more uniform method of expressing the opinions of superiors concerning subordinates in order:

"a. To avoid, so far as possible, snap judgments made at times when sudden decisions affecting individual employes are necessary.

"b. To standardize the elements considered as essential by the company, eliminating so far as possible disagreements among superiors concerning employees.

"III. A more important reason for the development of rating methods is found in the need for bringing to the notice of the management the progress of individual employees so that:

"a. Employees whose development seems to be rapid or whose ability seems to be unusual may be considered by the management for a wage increase or for promotion as a reward for exceptional merit.

"b. Employees who are doing unsatisfactory work in a given department may be considered for transfer to other work where they will be more valuable to themselves and the company.

"c. Employees who are unusually weak in certain traits may be given vocational counsel or given special training by the educational department.

"Decisions under a, b, or c, above should not, of course, be based on the rating reports alone. Such reports should be looked upon as of value in indicating those employees to whom the attention of the management should be directed. Decisions should be based upon a consideration of the qualifications of the individual as indicated by

mental alertness rating, trade test rating, past and present ratings of supervisors, previous experience, education, physical condition, etc." (D, pp. 365-366).

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Factors Affecting Human Efficiency

By EDWARD S. ROBINSON

LADING pig-iron on a freight car, driving an automobile, typing a letter, delivering an oration, planning an advertising campaign, directing the policies of a state or corporation, writing a poem, or devising a scientific theory—all these are work, and all of them can be done with varying degrees of efficiency. It is quite apparent that there are great differences between even the few samples of work which we have mentioned. Some require more strength than others, some require more of what we call "intelligence," some require more ambition, and so on.

The muscular strength required is certainly an important characteristic of work. Strenuous muscular work can best be done by young, but full-grown, males; it can best be done for short periods; it requires its own type of preparation and a particular kind of diet for the worker. One cannot reason that, because a bookkeeper does better on a light diet, in a quiet office, and with, perhaps, long but infrequent rests, that the same is true for the foundry hand.

The amount of intelligence required also differentiates one kind of work from another. A business executive or military commander can hardly be too intelligent in his work. But a girl running an ending machine in a paper-box factory would find much thought or any other form of intelligent behavior quite a handicap. She would be like the centipede of the following well-known lines:

The centipede was happy quite
Until the toad in fun
Said, "Pray, which leg comes after which
When you begin to run?"

This wrought her mind to such a pitch
She lay distracted in a ditch,
Considering how to run.

Certain tasks can be performed efficiently only by workers who are ambitious and constantly mindful of the remoter consequences of their work. A far-sighted attitude may, in other cases, reduce the efficiency of the worker. A friend of mine had charge of the employment and personnel problems of a large manufacturing concern. He became attracted by the unusual intelligence of a girl who was working at a very mechanical process in one of the company's shops. He kept her in mind and, when a position with excellent opportunities for advancement became vacant in the office, he saw to it that the girl was promoted to this place where her intelligence would be given a chance. She took the new position and did well in it for a few weeks. Then, to everyone's surprise, she requested to be transferred to her old position with its smaller wage and its lack of opportunity. The reason she gave was simply this: She had no ambition for business success. Her future outlook was toward marriage and a domestic life. In her factory position she had plenty of time, even while working effectively, to think about a future far removed from her job. In the office position, on the other hand, she had to concern herself constantly with business affairs. . . . Now, it is clear that this girl was an efficient factory worker because of a lack of any definite business ambition. She was unhappy in her office position and might well have become inefficient had she remained in it, because her domina-

ting purpose was so unconnected with her work.

But we cannot simply divide jobs into those requiring ambition and those that do not. The usual situation is very much more complex than that. The most mechanical duties will profit by a pride in one's skill and a purpose to excel. And in the highest type of professional duties ambition and remoter purposes must be harnessed. Too much thought of promotion and its rewards may make one disregard the routine and monotonous demands of the present-day's work.

While it is important, if we are going to make efficient workers of ourselves and others, to realize the main distinctions between different types of work, it is also important to realize the factors common to all types of human performance. Earlier psychologists and physiologists were constantly trying, by means of experiments, to determine the differences between muscular work and mental work. Certain important differences, such as the quicker onset of fatigue in heavy muscular work, were discovered, but we have now come to see that there is no such clear boundary line between the two as was formerly supposed to exist. Mental work is, hardly more than muscular work, pure brain activity. In the most abstract thinking, there is a pronounced involvement of the musculature.

The ocular, laryngeal, and facial muscles especially are extremely active in intense mental work. Just as too continuous work with hands or arms may lead to a temporary loss of control over these members, so, also, too continuous mental work may lead to a temporary loss of control over the muscles involved in that work. After too much walking, a person may be restless and unable to quiet himself, and after too much thinking, one may be unable to relax the facial muscles.

Such facts suggest why good digestion, circulation, and other so-called physiological conditions are almost equally important for sustained work of any kind, muscular or mental.

Much has been done to establish the main facts about heavy muscular work and how its efficiency may be kept on a high plane. For one thing, frequent rest periods are, as we have mentioned, necessary in the case of such work. Just how long they shall be and just how frequent depends upon the particular job and group of workers, but it is established beyond question that the relatively continuous labor that has little or no appreciable effect on other types of work simply will not do where heavy muscular work is concerned.

Somewhat less is known about the optimal conditions for more rapid and skillful work, probably because they are more complex and their results less easily checked. It is perfectly possible, however, with the methods already at hand, to determine many useful facts about machine operation of various kinds. The development of the touch system of typewriting has removed the eyestrain which would be present if the typist relied, even to a small degree, upon seeing the keys of the machine. It has also made possible a more rapid performance in writing from copy than could possibly be achieved in any other way. Better methods of operating many other machines have been and will continue to be worked out.

When we come to the highly intellectual types of work, our present knowledge is made up almost wholly of beliefs lacking the support of any known facts. Let us consider this question: How should the conference, in business or elsewhere, be conducted to bring about the maximum results? Should such a meeting function as a stimulator of thought or merely as a place where previous thinking is recorded? We

have all sat in conferences dominated by each of these plans, and most of us have our preference either for suggestive but rambling discussions or for the quick, time-saving meetings where opinions, though expressed, are seldom changed. But we do not really know, except in certain very obvious and exceptional situations, which method is better in the long run. We could argue about it, but it would be difficult to set one fact against another in judicial reasoning. This, of course, is just one illustration. What are the optimal work habits for executives, scientists, poets? Who knows? Many men engaged in complex intellectual tasks think they know, so far as they themselves are concerned, but even here it is always possible that they are merely slaves to some set of habits which cannot at this late date be broken with impunity, but which, for efficiency's sake, might in the first place have better been formed along different lines. A man who has looked after his correspondence just after luncheon for many years may be unable to dictate letters effectively at any other time. Still it would be foolish to conclude from this that just after luncheon is the best time for dictation for executives in general, or even that this man might not in the beginning have formed a wiser habit. Zola, the novelist, was said to construct his plots by a process of careful reasoning and deliberation. Other equally famous writers have doubtless written down their ideas just as they came. But, lacking further facts, we should hesitate to advise a young writer either to be highly critical during the act of writing or to cultivate the habit of giving his mind free rein. One of these methods may be better, and yet there is also the possibility that different writers and different types of writing actually require different methods.

These statements are not meant to imply that the complex tasks of life are beyond investigation. It is nearer the truth to say that so far we have accomplished little toward their adequate control and regulation, and that much of what we consider knowledge about the proper way of performing such tasks is mere opinion. Many of us have the strong conviction that holidays create in us a sort of inertia of rest which can be overcome only by genuine exertion. In regard to the simpler industrial operations there is a recognized period of low production after a holiday which is known as the "Monday effect." But whether this "Monday effect" is characterized by an actually low productivity on the part of intellectual workers or is merely a matter of discomfort is, so far as I know, undetermined. Still there is no reason why, with the collection of the proper type of evidence, it might not be determined.

THE MEANINGS OF EFFICIENCY

In certain simple tasks the meaning of efficient work seems obvious. Consider, for example, the addition of columns of figures. Efficiency in such work is certainly measured by the number of additions performed during some specified time. It is also measured by the accuracy with which such work is done. These two things, speed and accuracy, are not difficult to determine, yet the matter may become more complicated if we look at it closely. Speed and accuracy are both desirable results, but how much speed is worth how much accuracy? Let us suppose that we are testing two sets of working conditions. Under one set a group of persons engaged in operating adding machines does 10 per cent more work in a day, but with 10 per cent less accuracy. Are we to conclude from this that the two sets of working con-

ditions are equally good? If the purpose for which we are to use these results is a rough one where approximations are sufficient, it may be better to select the condition where more work is done. If, on the other hand, slight errors are of considerable consequence, it might be better to reduce speed by even 50 per cent in order to achieve a condition where there will be no errors. In other words, speed and accuracy are both criteria of efficient addition, but their relative importance must be determined with reference to the particular purpose of the work.

Speed and accuracy are not the only standards of efficiency even for simple tasks. There are almost always remoter criteria which are of fundamental importance. It is conceivable that a piece work system with a decisive penalty for spoiled materials might, for a given operation, result in greater production and less loss of material than any other arrangement. Yet this apparently more efficient plan might introduce an element of strain followed sooner or later by a discontent for which even the workers themselves could give no adequate explanation. Of course, habituation will often eliminate the strain apparent in some programs of work, but it will not always do so. No investigation of working conditions is worth carrying through unless one is constantly on the alert for the probable *long-run* effects of innovations.

The satisfaction which one gets while working is another thing which may be taken into account. This is especially true because other criteria of efficiency, such as speed and accuracy, do not show a direct correspondence with what Professor Thorndike has called the "satisfyingness" of work. The long and continuous performance of most types of work leads to a falling off in accuracy or speed, but satisfying-

ness generally decreases at a more rapid rate than these other two. It is possible for a worker to become utterly bored and disgusted without an appreciable loss in the accuracy or speed of his performance. Still, it is important to know of the development of that boredom or disgust, because it may indicate a coming collapse or revolt which may be of far more importance than an early loss in accuracy or speed. Many, in regulating their own lives, have forced themselves to work beyond the point where boredom and dissatisfaction usually develop and now they are without those indicators of approaching staleness or fatigue which others possess. Often, too, tasks are so stimulating that there is no loss in satisfaction from the work until one has reached exhaustion, or at least a point of very low efficiency. In wisely limiting our hours of highly interesting work, we cannot rely upon our feelings while the work is in progress. Good judgment is needed. Of course, a great many, perhaps the majority, of us pay too much attention to the warning signs of our own boredom and dissatisfaction. We cease working or decrease the ardor of our efforts at the least boredom or symptom of fatigue. Since, in most cases, boredom and feelings of tiredness develop long before any appreciable loss in capacity, too much attention to these unpleasant symptoms will prevent anything like the full exercise of our powers. But by persistently ignoring these things it is usually possible to reach a point where we ignore them automatically.

The discussion above implies that prolonged habituation to work of a given kind reduces the boredom and dissatisfaction that goes with that work. This implication needs some qualification. In the first place, the repeated performance of the same kind of work removes the element of novelty

and to that extent increases the likelihood of boredom and dissatisfaction. As a usual thing, this boredom and dissatisfaction, which grow out of the repetition of the work, will be decreased by its further repetition, but this is not always so. The repetitions will make one better able to disregard feelings of dissatisfaction only if there is a desire to disregard those feelings and to be on with the work. If we greet each discomfort which continuous work produces with a tear for our fate, repetition will make these discomforts more and more evident and self-pity more and more habitual.

In speaking of efficiency, then, one may refer to such very evident matters as accuracy and speed, or to less evident consequences and satisfactions of work. It is important for us to recognize that there are these different meanings of efficiency and that factors which increase efficiency in one regard may act quite differently in another.

THE EXPERIMENTAL STUDY OF EFFICIENCY

Having adequately described a given type of work and having determined its purpose, one is in a position to study the conditions which affect its efficiency. The natural method to employ, where possible, is that of experiment. That is, the work should be performed by the same persons or by different groups of persons of equal average ability under carefully recorded conditions. Such experiments have been made to test the importance of rest periods, posture, ventilation, distractions and many other factors.

The results of these investigations of working conditions are important, but the nature of their importance is often misinterpreted. The point can be best illustrated by an example or two. Suppose that we have five groups of machine workers having equal

ability. All are doing the same work, except that one group is resting 12 minutes out of each hour, one 9 minutes, one 6 minutes, one 3 minutes, and one 0 minutes. Now suppose that the 12-minute group produces 30 units of work in an hour, the 9-minute group 32 units, the 6-minute group 25 units, the 3-minute group 15 units, and the 0-minute group 10 units. To what extent can we say from this that work of this general type should always be performed with 9 minutes of rest per hour? If we were reasoning from the experimental situation to another almost identical one perhaps no great error would occur, but in going from one operation to another within the same plant or from an operation in one plant to the ostensibly same operation in another, all sorts of undetectable differences creep in to invalidate specific conclusions. People are too variable and the operations in industry, even when called by the same name, are too variable for an accurate inference of exactly optimal rest periods from one group of workers to another or from one type of work even to similar work. The value of such an experiment as this lies in its indication that high efficiency in this general type of work depends upon the proper introduction of rests and its hint as to what rests will be advantageous in similar instances. This information can become accurately effective, however, only when it leads to a special experiment for the work and workers whose efficiency we wish to raise.

Many experiments, using many different types of work and workers, have been carried out to determine variations in efficiency during a day of work. Some have found the greatest efficiency late in the morning and late in the afternoon. Others have found a continuous decrease in efficiency during the day. It is clear that such results do not show the most efficient hour for

a type of work that is not specifically dealt with in these experiments. It is equally clear from these results, however, that a worker's efficiency does vary to an important degree during the day and that the high and low points of efficiency may be determined for specific types of work.

Both of these cases illustrate the function which can be performed by experiments on efficiency. They give us clues as to what factors are active, perhaps advantageously or perhaps disadvantageously, in work of a general class, but specific and accurate information comes only out of experiments under the identical working conditions where the results are to be applied.

EXPERIMENTAL METHODS

There are a number of methods of conducting efficiency experiments. None is perfect, but each is fairly suitable for its own limited range of problems.

With the Continuous Work Method, complete records are kept of the subject's efficiency. Suppose we wanted to know the speed and accuracy of production at different hours of the day. If we employed the Continuous Work Method, we should take account of everything done during each successive hour. This might mean type set, labels pasted, shells inspected or the like, and the quality of this work. Or suppose we wanted to study the progress shown from day to day by a group of workers just learning a certain operation. In this case we should again keep track of speed and accuracy for each hour or day worked. The advantages of this method are that it does give a continuous record of efficiency and that these records are from actual performance on the job rather than from an artificial test. A disadvantage is that unless the work in question is very homogeneous in opportunities for pro-

duction throughout the period studied, it is difficult to explain the fluctuations in efficiency which occur. Consider that we had records on the hourly production of a machine operator and that these records showed a point of very low production just before luncheon. This drop might be a sign of a general loss in capacity on the worker's part, or it might merely mean that, because of shop conditions independent of himself, less work became available for him at that hour. On the whole we may conclude that the Continuous Work Method is most applicable for the study of the simplest and least variable of industrial operations. Where the requirements and opportunities of a worker are never the same in two successive hours, the use of this method is naturally out of the question.

The Continuous Work Method and the Testing Method are almost opposites. With the Testing Method we apply a brief test of efficiency at intervals which vary according to the specific purposes of our investigation. If we wished to apply this method to the study of fluctuations during the day, we should apply one or more tests of a few moments' duration, perhaps every hour. The tests which have been used in such experiments are many. In the earlier investigations of the efficiency of school children, psychologists endeavored to use tests of simple and presumably fundamental character. Among these were the perception of two points placed upon the skin, and speed of reaction to some simple stimulus such as a sudden sound or flash of light. It was finally realized, however, that one's general efficiency might be considerably affected without his showing it in such simple operations as these. There has resulted a wide search for tests which would detect any slight variations in one's general level of efficiency. Most of those who have

engaged in this search have assumed that the desired test would be one which would force the subject to work near the limit of his capacity. This assumption that a performance near the limit of one's capacity would more quickly show the effects of fatigue or any other disturbing influence certainly seems reasonable. Among the tests proposed is the McDougall Dotting Machine. By means of an endless belt a series of dots are brought before the subject who responds according to the character of the dot. One of the virtues of this test is that the speed of the machine can be so regulated as to keep the subject extending himself. In many tests the only regulator of speed is the subject himself, and he is likely to be conservative in the pace he sets himself. It is also assumed by some that no one test can be expected to indicate the general level of efficiency. Such investigators would advocate the use of a group of tests in the belief that the average performance in several tests would come nearer to representing the general level of efficiency than performance in any single test. Groups which have been actually used in experiments have included the time of reflex actions such as winking, the speed of tapping or reading, steadiness of the hand, solution of arithmetical problems, and tests of many other functions.

There still remain major problems in regard to this testing method. Even if there is a general or average level of efficiency which we can measure with some accuracy, that average level may be considerably divergent from the level of efficiency which is of practical significance. If tested every hour in the day with such a test as the McDougall Dotting Machine, a worker in a shop might show no loss in capacity. Yet there might be a real and significant loss going on in his capacity to

perform his regular tasks. We are safe in concluding that the more nearly a test approximates the work in which we have a practical interest, the more the test will tell of a worker's capacity for that work.

The brevity of the test performance and the more or less exciting fact that it is a test also furnishes a problem. It has been found that persons who have been without sleep for several days can perform normally in a brief test, but no one would claim from this that their general efficiency was unaffected by a long insomnia.

Despite all this, the Testing Method is one that we have to fall back upon in many cases. As we have pointed out in our discussion of the Continuous Work Method, few jobs are so homogeneous that actual production records can form an accurate basis for study. In such cases periodical tests, preferably samples of the work one is studying, must be employed.

The use of the Continuous Work Method and the Testing Method imply that we are studying efficiency under fixed conditions of work in order to evaluate those conditions. Instead of purposely varying conditions or methods of work, one may study the methods or conditions which are known to produce good results. This is essentially what is done in Motion Studies. The methods of good workers or bad workers are analyzed, sometimes with the aid of motion pictures, in order to determine the optimal methods of performing a certain operation. There is little question but that this procedure may yield important information. There are, however, certain precautions to be taken. It is not necessarily true, for instance, that the method by which one worker produces exceptionally good results will yield the same results if adopted by other workers. Many fair golfers

have been ruined by being forced into a style of play which was very effective for younger players or players of different build. A questionable, though perhaps justified, conclusion drawn from motion study is that, since the slow and accurate performance of a task involves different movements from the rapid and accurate performance of the same task, therefore the beginner should be forced to work at the speed that is later to be required of him. An English psychologist recently conducted an experiment indicating that the transition from slow to rapid performance in typewriting was not particularly disadvantageous. One group of students began by striving for accuracy and another by striving for speed. When, after considerable practice of this sort, the instructions to the two groups were reversed, it was found that the capacity to be accurate had developed even in the group formerly emphasizing speed and actually making more errors each day while doing so. Similarly the accuracy group had acquired the capacity to work rapidly even though no great increase in speed revealed itself while accuracy was emphasized. This experiment is not entirely conclusive, but it suggests the possibility of acquiring skill by shifting from one method of work to another. The shift does not mean that one is in the position of acquiring two entirely distinct kinds of skill. In other words, conclusions drawn from qualitative analyses of performance must ultimately be checked by production records of some kind.

FACTORS AFFECTING EFFICIENCY

The actual factors which operate to determine efficiency are innumerable. It will suffice if we indicate some of the principal ones:

1. The principal factor in increasing

efficiency is *practice* or *repetition*. If one can perform an operation at all, the repetition of that performance usually makes him more and more skilful. Typically this acquisition of skill is rapid at first and then becomes slower and slower, until finally a level is reached where further practice is ineffective or practically so. In the training of workers, the length of the education period may well be based upon a study of the rate of learning. Additional practice may always result in additional skill, but there is the question as to whether skill is being acquired at a sufficient rate to justify further training. A typist might increase her skill for a period of several years, but this does not mean that she should ordinarily be kept in a business school for that period. By far the greater part of the skill she will ultimately possess will be acquired in the first several months of her training. It is during that early period that she should be kept in school. Just how long the early period of rapid progress lasts depends upon the individual and the act of skill under consideration. It is possible, however, by applying the proper tests, to keep track of the rate of progress in a particular case and to judge when, for all practical purposes, further formal practice may be dispensed with.

Before practice can really begin to increase our skill it is usually necessary to have a pretty clear notion of what we are trying to do. The repetition of a faulty swing in golf will simply establish that swing more and more thoroughly until it will be almost impossible to acquire a swing capable of producing good results. There are a number of ways in which we discover how to act most effectively. We may think the thing through. This is possible when we are fairly familiar with the general class of acts to which

the one in question belongs. When one is forced by circumstances to alter his methods of conducting his business, he may achieve success by thought. If, on the other hand, one is confronted with a mechanical puzzle of a wholly unfamiliar type, thinking is of little avail. One has to handle it, manipulate it and experiment with it. This is called the *trial and error* method of problem solving. Its use is not by any means a mark of unintelligence. It rather signifies that one is confronted by a problem of an unfamiliar type.

In many cases of human learning neither thinking, in the sense of real reasoning, nor trial and error are required. Instead, the learner is started correctly by instruction. This instruction is of many varieties. It may consist merely of the performance of the act of skill in the presence of the learner, or it may consist in verbal advice or information. The best method depends again upon the learner's familiarity with the type of problem before him. A word or two of advice might be the only thing necessary to set up in an experienced machine operator an improved method of work. But if the operator were a complete novice, one might have to sit by him, watch and comment on his every move and perhaps even grasp his hands and arms and guide them in the proper direction.

While the optimal method of instruction is difficult to determine, it is a thing well worth pursuing. Perhaps the most certain things about it are its importance and its dependence upon the individual, upon the nature of the act being learned, and upon other details of concrete situations.

Granted that the learner knows what he is about, the fixation of accurate action and the elimination of faulty action depends upon a large variety of factors such as the duration of the

practice periods and the intervals between them, the health and age of the learner, and so on. Most important of all these factors are the incentives for learning. We are all familiar with the fact that the lash for wrong acts and food for correct acts seems necessary in training animals. At least the learning progresses more rapidly with these two very urgent incentives. In human learning the incentives are not always so apparent, but they are nevertheless present.

Concerning the many incentives such as food, avoidance of punishment, future bodily comfort or protection against discomfort, or incentives of a more idealistic type, one cannot lay down a general law of their relative effectiveness. With the young and the ignorant, only the more immediate incentives have much influence. With those who already have systems of ideal purposes, the remoter incentives may function even more strongly than the more immediate ones. The choice of incentives must depend, too, upon the act to be acquired. The philosopher or statesman may keep at work because of a desire for consequences which he himself can never hope to experience, but a merchant of confectionery would hardly develop his skill under the anticipation of such remote consequences.

While more immediate or more remote incentives may dominate one's learning, often there is at work a combination of purposes. The worker may have chosen his calling because it seems to him noble and dignified, but the daily steps in attaining a mastery of it are likely to be affected by a desire to learn faster than his companions and to secure promotion or praise from his superiors.

2. One of the most familiar factors which tend to reduce efficiency is *too continuous work*. Although the repeti-

tion of an act is necessary for the attainment of skill, the too continuous repetition of that act causes it to become less efficient. We usually speak of this factor, which we sometimes call fatigue, as though it were simple. As a matter of fact, the nature of this so-called fatigue varies greatly for different types of work, and even for a comparatively simple activity it is quite complex. Continuous work tends to produce poisonous products, known as fatigue toxins, faster than they can be removed by the blood stream. Either or both of two consequences may result. The functioning of the organism may be directly interfered with, or painful sensations may be set up which distract the worker and tend to make him decrease his efforts. Too continuous endeavor along one line also produces boredom, restlessness and other states which interfere with efficient action. Fortunately we can test by experiment the effects of varying degrees of continuity of work upon its efficiency, and choose optimal distributions of work and rest without determining just what constitutes fatigue in a particular case.

3. The effect of *distractions* is another interesting matter, the mechanisms of which are only partially understood at the present time. One of the best experiments on distractions was performed by Dr. J. J. B. Morgan, who at that time was working in the Columbia University laboratory. Dr. Morgan found that the presence of loud sounds might lead to a temporary increase in efficiency, but only because the worker expended an unusual amount of effort. Distractions then might be considered beneficial if it were not for the fact that the greater exertion was likely to bring quicker fatigue. We should hardly expect distractions to have this effect in all cases, but Dr. Morgan's experiment indicates the complexity of the

problem and warns us against too superficial interpretations of the results of a change in working conditions.

In the above discussion of human efficiency, we have touched only a few samples of the many factors which have already been studied. Other important factors are illumination, atmospheric conditions, amount of sleep, diet, drugs and social surroundings. Even within the limited ground covered, we have been forced to qualify almost every conclusion. This is not because the student of efficiency has discovered nothing of definite importance, but because every concrete situation in which men work deserves its own exhaustive analysis. In engineering or medicine there are gathered together facts to be taken account of in specific situations, but those facts must always receive a fresh evaluation in their concrete setting. In the realm of human efficiency this is even more true. Rest periods, practice, fatigue, distraction,—all these are important, but their precise importance in life cannot be predetermined by formula. There are also methods of studying efficiency, and their advantages and disadvantages can be given a general statement, but always they must be reëvaluated and modified if they are to be used effectively in the factory, office, or school. The study of human efficiency will make one more capable of solving complex problems of human engineering, but it will never (or so it now appears) furnish ready-made formulas which can be applied like patent medicines to the cure of inefficiency.

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The Motives-in-Industry Problem

By ARTHUR W. KORNHAUSER

PSYCHOLOGISTS and economists have talked a great deal about motives. Attention has been insistently called to the importance of understanding *why* people do the things they do—the importance both for theoretical economics and for the practical needs of industry in dealing with its human nature problems. Most of the books and articles on economic motives maintain that in this field are to be found the most basic questions of business psychology.

Discussions of motives have been common in other fields as well as the economic, and a considerable body of writing has accumulated on the subject. It is generally recognized that the problem of motives is essentially the same whether it be discussed in connection with politics, religion, education, family life, or what not. Motives in economic life are not different from motives in other spheres. Most of this paper, accordingly, treats of the general problem.

There is one point of view that is prominent in almost all the literature on motives. We refer to the emphasis on the impulsive and habitual nature of human conduct and the vigorous reaction against older interpretations that view behavior as almost wholly rational and deliberate. In this anti-rationalistic trend, recourse has been had chiefly to the substitute explanation afforded by instincts. As a consequence, discussions of motives have been in the main discussions of instincts. A large number of writers have taken the view expressed in the following words by one of the most influential of the instinct-psycholo-

gists:¹ "Directly or indirectly the instincts are the prime movers of all human activity."

At present there is in many quarters a feeling that the treatment of motives in terms of instincts is not adequate, even though the reaction against rationalistic theories be accepted. A number of writers have tried to do away with instincts entirely and a few have attempted to point the way to a psychology of motives which will be sounder and closer to established facts.

We shall pass hurriedly over some of the attempts that have been made to deal with the problem of motives in terms of instincts and the like, and shall then try to indicate the lines along which a more critical view may be developed. It is first of all necessary, however, to ask what the problem is which discussions of motives are seeking to solve.

THE PROBLEM OF MOTIVES

Broadly stated, the problem of motives is the problem of explaining behavior. What leads people to do the things they do? Why do men work and why do they quit work? Why do they go to war? Why do they buy the things they do? Why do they vote and marry and play golf and chew gum? Questions of this sort have point only when they inquire concerning actions that are, or appear to be, purposive. We do not ask the motive for simple invariable or stereotyped ways of acting which are readily accounted for in straightforward mech-

¹ William McDougall, *Introduction to Social Psychology*.

anistic terms — activities such as breathing, yawning, winking or swallowing food. The problem is to explain our actions that are variable and seemingly guided by a purpose.

The problem thus stated cannot be avoided by new definitions of terms or by discarding bothersome ones like instincts, thinking thereby to sidestep the difficulty. The facts to be dealt with are clear. People do perform varied acts which are ordinarily called purposive—complex series and combinations of movements which accomplish certain ends or move towards certain goals. The activities involved in securing food or building a house, in conducting a political campaign or selling a pair of shoes or running a lathe—any of the things we do beyond making mere automatic movements in response to the things about us—are examples of these variable purposive sequences of acts. The practical problem of understanding people's behavior—the problem of motives—is, then, to accumulate some useful facts which will enable us to see how it comes about that the individual does these things. Even though we abolish all such terms as purpose, motive, instinct, and urge, this problem remains.

The problem of motives is no less insistent practically than it is theoretically. We wish to know why men work, why they leave their jobs, why they buy X-brand tooth paste, why they join trade unions. We wish further to know what factors are particularly important in causing these activities, and what new factors or motives can be utilized that will lead to different or more effective action. We wish to know these things in terms that are useful to us—in terms, that is, of facts which will enable us, in some measure, to predict and control behavior. It is questionable how useful

the answers are that have typically been given.

SOME ATTEMPTED SOLUTIONS OF THE PROBLEM OF MOTIVES

One fundamental tendency characterizes almost all thinking about motives, both popular and scientific. That tendency is to assume that there must be some inner force or drive which impels men to act. Beginning with this deep-seated assumption, most writers on motives conceive their problem to be the specifying and labeling of these internal urges. They attempt to provide the missing link which will fill the gap in our knowledge concerning the causes of particular activities. Some of the assumptions are valuable scientific hypotheses subject to proof or disproof; but most of them are pure myths or magical explanations that are accepted as answers to the problem and not as tentative guesses to be tested and weighed.

In crudest and least useful form, these explanations turn to some one inclusive vital principle or general drive which is the mainspring of action. This central driving force may be a "soul," a "transcendental ego," a "vital urge," dynamic "human nature," "the will to do," "libido," desire for recognition, or what not. The name makes little difference. The notions are all extra-scientific shots in the philosophic dark. As explanations they are myths. In a scientific sense they explain nothing. At best, they simply state the fact that *man is active*—and then read into that activity the presence of some activating power or force.

Another somewhat different conception of a general motive—and one that has had peculiar attractiveness for many minds—is the view that the great driving force of humanity is the desire for pleasure and that all activity

is to be accounted for as the seeking of more pleasurable alternatives and the avoidance of pain. This hedonistic view breaks down in the face of the facts. For much of our behavior is habitual and impulsive; it involves no deliberation between greater and lesser pleasures. If, in answer, it be maintained that we need not consciously recognize the pleasure motives, then our answer is that there is no way of defining the pleasant act save that it is the one performed. That clearly makes the hedonist reason in a circle, for he says we do the thing that is more pleasant and when asked what is more pleasant he can but reply that it is the thing we do.

An attempt actually to apply this pleasure-pain theory of motives is the best demonstration of its uselessness. One comes always to the statement: The man acted thus and so because it was more pleasant to act that way than any other way. Which is exactly as helpful as saying: He acted that way because he was bound to act that way. This pleasure-pain notion, like those of the preceding paragraph, explains nothing and serves merely to obscure our ignorance. It is a purely verbal way out of the difficulty.

DESIRES AS MOTIVES

In addition to the foregoing *general* explanations, many particular drives or specialized inner forces have been utilized in attempts to deal with the problem of motives. There are two closely related conceptions of specialized springs of action that have been particularly prominent—a view built about the notion of specific desires or elementary pleasures and pains, and the view which makes use of instincts. These conceptions, especially that of instincts, constitute the most important attempts that have been made to deal with the problem of understanding

the "why" of human activities. We may, accordingly, consider each of them a little more closely.

The notion of motives that identifies them with concrete desires or ideas of specific pleasures is very common and apparently very sensible. If we ask why a man buys bread or joins a union, the common-sense answer usually runs: "Because he desires to eat the bread"; and "Because he desires certain ends which he believes the union will help him to realize." Similarly we say that the wage earner works because of his desire for money. Analogous answers can be given for all activities—with varying degrees of satisfyingness. To the extent that a definite desire can be seen back of an action, we ordinarily feel that the discovery of that desire gives us an adequate understanding of the action and its motives. In popular speech, these desires are the explanatory factors of behavior.

The statement that such desires are real and important motives is, we believe, thoroughly true. To think, that they are the *only* motives, however, is to fall into a great error. The activity of the wage earner may be explained as due in part to the desire for money, but it has an indefinite array of other causes as well—"force of habit," fear of the boss or of losing his job, lack of education, intelligence, or early opportunity, possession of certain physical and mental capacities, and so on. All sorts of facts about the individual help to explain why he is doing what he is at the present time. Various ones of these facts are practically important, moreover, in understanding men and dealing with them. Desires are only part of the story.

The emphasis on desires as springs of action is not at all limited to popular usage. Discussions of motives from this same point of view are contained

in the writings of a number of scientific psychologists—especially British psychologists of the 18th and 19th centuries. In these psychological treatments the attempt is made to work out systematic classifications of desires or of "simple pleasures," and considerable attention is given to the problem of how these desires are modified and controlled. Some of these century-old writings sound remarkably similar to discussions of the present day. The views are not essentially different and the changes are largely in terminology.

The various views of desires as motives are good so far as they are applicable, but they fall far short of covering the whole field. Many other determining causes are important. Moreover, it is clear that in many activities there is not present any definite desire or anticipation of pleasure to be gained. A great part of our behavior is habitual and impulsive, without any consciously entertained goals or desired ends. Recognizing this fact, writers have had recourse to "unconscious desires" and "unconscious purposes." This is an obvious subterfuge—and a dangerous one since it is likely to mislead us into supposing that we are explaining actions when we are simply ascribing as motives certain non-entities which we call unconscious desires.

If every act were preceded by a conscious desire or anticipation of the end to be achieved or of the reason for the action, this view of desires as motives would be essentially sound. As a matter of common experience, however, this is not the case. The occurrence of activities not motivated by any antecedent desire or conscious purpose is fully recognized in popular speech and even in the proceedings in our courts of law. We make a distinction between premeditated crimes or those committed with malice afore-

thought, and those that are the result of momentary impulse. In the field of economic activities modern writers have emphasized repeatedly the large part played by so-called unconscious desires. Any useful conception of motives must face the fact that much of our apparently purposive activity cannot be accounted for in terms of conscious desires.

Now in these cases where desires are not present as consciously observed facts, to *assume* their presence in the form of unconscious desires is simply to dodge the difficulty. Any practically helpful study of motives must make use of facts; substitution of high-sounding phrases to fill the blank places in our knowledge serves merely to hide the real problem. The real problem, that is to say, is to find something that is present in those cases where desires are not. And even where desires are present, other explanations may sometimes prove more useful.

INSTINCTS AS MOTIVES

Most current writers attempt to avoid the difficulty of unconscious desires through the use of instincts. The doctrine of instincts is very similar to the view of desires which we have been discussing. Instincts as springs of action differ from the desires principally in two ways: They are thought of as being an inherited part of the biological organism; and they are viewed as being not necessarily conscious. A few paragraphs from one of the very well-known articles on economic motives² will serve to illustrate the instinct view:

Man is born into his world accompanied by a rich psychical disposition which furnishes him ready-made all his motives for conduct, all his desires, economic or waste-

² Carleton Parker, "Motives in Economic Life." See *The Casual Laborer and Other Essays*.

ful, moral or depraved, crass or æsthetic. He can show a demand for nothing that is not prompted by this galaxy of instincts. He is a mosaic of unit tendencies to react faithfully in certain ways when certain stimuli are present. As McDougall has graphically put it, "Take away these instinctive dispositions with their powerful impulses and the human organism would become incapable of activity of any kind; it would lie inert and motionless like a wonderful clock-work whose mainspring had been removed or a steam engine whose fires had been drawn. These impulses are the mental forces which maintain and shape all the life of individuals and societies, and in them we are confronted with the central mystery of life and mind and will. . . .

The importance to me of the description of the innate tendencies or instincts to be here given lies in their relation to my main explanation of economic behavior, which is:

First, that these instinct tendencies are persistent, are far less warped and modified by the environment than we believe; that they function quite as they have for a hundred thousand years; that they, as motives in their various normal or perverted habit form, can at times dominate singly the entire behavior and act as if they were a clear character dominant.

Secondly, that if the environment through any of the conventional instruments of repression, such as extreme religious orthodoxy, economic inferiority, imprisonment, or physical disfigurement, such as short stature or a crippled body, repress the full psychological expression in the field of the instinct tendencies, then a psychic revolt, a slipping into abnormal mental functioning, takes place, with the usual result that society accuses this revolutionist of being either wilfully inefficient, alcoholic, a syndicalist, supersensitive, an agnostic, or insane.

The list of instincts used by this author is as follows:

Instinct of gregariousness

Instinct of parental bent: motherly behavior: kindliness

Instinct of curiosity: manipulation: workmanship

Instinct of acquisition: collecting: ownership

Instinct of fear and flight

Instinct of mental activity: thought

The housing or settling instinct

Instinct of migration: homing

Instinct of hunting

Instinct of anger: pugnacity

Instinct of revolt at confinement: at being limited in liberty of action and choice

Instinct of revulsion

Instinct of leadership and mastery

Instinct of subordination: submission

Instinct of display: vanity: ostentation

Instinct of sex

The outstanding criticism which we would make of these instinct explanations is identical with that which we brought against unconscious desires. These instincts which are used as driving forces are after all only logical abstractions. They are assumed to represent some actual processes or structures within the individual, but in the absence of our ability concretely to specify those processes and structures, the instincts remain mere empty labels. In the case of some few of the instincts where we can point to definite bodily bases (sex and food getting, for example), the physiological facts are highly important determining causes for conduct. With almost all the instincts, however, it is entirely impossible to point to any concrete physiological processes. Gregariousness, acquisitiveness, constructiveness, curiosity, and the rest of them—these are abstract names, not urges of some physical or physiological sort.

Some of the most serious difficulties of instinct theories are due to the as-

sumption that instincts represent actually existing entities within the individual. The whole notion of instinct repression, for example, made popular through recent psycho-analytic literature, grows out of such a view. Now it appears very reasonable to discuss repression of sex impulses and the indirect outlets the impulse may find, since we know of a real, more or less persistent, and recurrent sex appetite or sex restlessness with a physical basis. Are we therefore justified in assuming the same repressive mechanisms and outlets for such instincts as workmanship, curiosity, pugnacity, leadership, etc.? Obviously not—for in these instincts we know of no actual process or structure, either mental or physical, which insistently remains or returns. An environment which prevents the occurrence of fighting activities, creative workmanship and the like may be bad for the individual or it may not. Certainly we have no evidence that there are appetites or impelling urges demanding expression in the case of the instincts named. Most of the talk about the *necessity* for instinct gratification is gratuitous assumption, bolstered up by a very shaky theory that conceives of instincts as persistent, self-assertive entities.

There is one use of instincts, however, which is defensible. They may be treated as convenient names for *classes of observed activities*. While we do not ordinarily think of instincts in this way, it is probably true that whatever plausibility the instinct-explanations have, is due to the fact that they do represent a means of pigeon-holing many of our common human ways of acting. Acquisitiveness is an abstraction, but it stands for the fact that individuals do perform many acts that involve the acquiring of something or other. Similarly with the other instincts. Now, in so far as

the instinct-name thus represents typical or habitual ways of acting, it is at the same time representative of certain determining causes of the present activity. The fact that individuals have been acquiring things in the past (a fact based on observations of their activity and now represented by the term *acquisitiveness*) is a cause or determining factor in their further activity of acquiring—and it is a useful causal factor to know about since it does in some degree enable us to predict the future activity of individuals.

This usefulness of instinct-explanations is not great because the observed facts and the possible predictions are not sufficiently specific. This is bound to be the case. The use of names for classes of activity in this way is one step in advance over the lumping of all activity into one class as "human nature," but it leaves much to be desired. To say that an individual will do this, that, or the other thing "because it is human nature" tells us next to nothing. To say that his present act is due to curiosity, imitativeness, or the like tells us just a trifle more—precisely because it is not quite so general or coarse a classification of observed ways of acting. Still finer classifications will be proportionately more definite and hence more valuable in understanding people and dealing with their activities. As the classification is made less and less general, it approaches nearer and nearer to the use of specific facts. The most useful treatments of motives, we believe, are those that keep closest to the concrete data that are connected with the particular activity to be explained. We would substitute for all the general and theoretical solutions to the problem of motives, answers consisting of definite factual material.

We shall try to indicate in the following paragraphs the way in which more

detailed analyses of the facts of behavior and events related to behavior, may be viewed as a scientific attack on the problem of motives.

MOTIVES AS CAUSES OF ACTION

Motives are ordinarily used to refer only to those causes of action that are *within* the individual and that can be thought of as more or less closely analogous to conscious desires and aversions. In actual practice these motives—the individual's appetites, muscular sets, habits, desires, beliefs—are so dependent upon external factors that it becomes impossible to study them in isolation. That is to say, the problem of motives becomes, practically, the general problem of arriving at the causes of our actions. To solve the problem of motives really means to settle almost the whole field of psychology. All that we can do here is to suggest a way of thinking about the causes of actions and to indicate some possible modes of attack upon specific cases.

What is meant by the "causes of actions"? The answer to that question will go far toward clarifying the problem of motives. It will also help to explain the variety of apparently conflicting opinions. It is the belief of the writer that many of the matters of gravest disagreement in the field of motives are due to a failure to utilize a sound and scientific conception of causation. We shall try to outline such a view. Our discussion may hope, moreover, to point the way to possible methods of attack upon concrete inquiries as to the motives behind particular actions.

A scientific view of causation differs materially from the popular conception. For science the notion of cause and effect reduces to this: that certain happenings (the causes) have been found to precede certain other hap-

penings (the effects) more consistently than would be the case by mere chance, and this antecedence can be shown to continue regardless of changes in all other happenings. One need not think of a cause as related in any peculiar or necessary way to its effect. A causal explanation of an occurrence is a description of certain preceding events, changes in which are found to be always associated with correlated changes in the succeeding event or result. Two important corollaries follow from this conception. In the first place, the causes of any event are manifold and varied and may have any degree of nearness to, or remoteness from, the effect. In the second place, there is no one set of causes for a given effect. Even though one group of causes is determined, there is no reason at all for thinking that other equally real sets of causes may not be found.

Let us apply this view to a concrete example. Suppose an employe, X, strikes a fellow worker, thus beginning a fight. We ask: Why was the blow struck? A partial answer may be given in terms of the immediately preceding occurrences. The man had addressed an insulting remark to X. This is one significant cause of the fight provided we have evidence that hearing remarks of that sort ordinarily leads X (or men in general and hence, by inference, X also) to strike the person who makes the remark. In so far as this "insult and fight" sequence has occurred repeatedly in the past, we believe or predict it will recur and we speak of the relation as causal. Clearly many other causes may be present. X may have been fatigued and we may have evidence that in this condition he is ordinarily irritable and ready to fight. There may be an indefinite number of causes present at the time the act occurs, such as the presence of other men who laugh at the insult and

the hatred X already had for the individual who insulted him. We might find several different sets of causes—a physiological set, a mental set, a social set, a physical and chemical set—any one of which would be a satisfactory answer to the question: Why was the blow struck?

Usually we cannot find sufficiently complete and useful statements of the causes for an act in the immediately preceding occurrences. We must go back of these. We go as far back as may seem desirable for the purpose at hand. Each of the causes of an act is itself the result of many preceding causes. Thus, X's fatigue may be due to loss of sleep. It is then as legitimate to speak of the loss of sleep as a cause as it is to call the fatigue a cause. We may go back farther, and say that the fact that X's baby cried during the night is a cause of the fight the next day. The causal series can obviously be extended to the causes for the infant's crying and the causes back of those. Precisely the same sort of house-that-Jack-built procedure is possible in any inquiry into causes. Nor is there any one series that must be followed. We might have branched off at any point and asked, for example, the causes for X's not sleeping in spite of the baby's cries, or the causes for the influence of fatigue on behavior, and so on.

It has frequently been noted that light is thrown upon men's motives for particular acts by their subsequent, as well as by their preceding, activities. If a man steals some money and is seen using it immediately afterward in stock speculation, we are likely to assume that we know the motive for the theft. If a man leaves his present employment and goes directly to a better job in a neighboring plant, we decide that we know his reason for leaving. Such cases can readily be

brought into line with the view we have developed. The later observed activities serve merely as the grounds for an inference as to desires or purposes that were in the individual's mind preceding the act. These inferences are based on the analogy between the present acts and similar courses of action we have encountered in the past. Often this reading of motives by inference is misleading. The subsequent acts may not represent the working out of a previously entertained purpose, but may be acts hit upon *after* the occurrence of the act which they are wrongly used to explain. The man who stole the money may not have thought of stock speculation until the money in his hands suggested it to him. Where care is taken to guard against unwarranted inferences, however, valuable information may be had by observing subsequent behavior. But it is usually safer to explain actions in terms of preceding rather than succeeding events, and it is almost always more useful.

Another matter much discussed in connection with motives is the contrast between real or true motives and fictitious motives or assigned "good" reasons for actions. If we had asked X why he struck the other man, he perhaps would have told us: "Because I decided he needed a thrashing to teach him a lesson." This alleged motive would ordinarily be called "rationalization" since it is fairly clear that X did not act to teach a lesson and that there was no deciding involved. This rationalization would be contrasted with real reasons such as the impulsive resenting of insults and the fatigue. Examples of such rationalizations are extremely common. We are continually giving to ourselves and others high-sounding reasons for our actions which are often recognized by others, if not by ourselves, as being fictitious.

But what is the difference between these two classes of explanations? That it is not a self-evident distinction appears in the fact that we are often unable to say whether or not a particular reason is *real* or only "*good*." In line with our preceding discussion of causes we would say that the motive is a real one to the extent that it is shown to be a necessary correlate of the act which is being accounted for. That is, it is real if in its absence the effect would have been different. By the same token the cause is fictitious if the effect would have been the same regardless of the presence of the alleged cause.

The notion of rationalization as opposed to real motives is particularly prominent in the popular Freudian writings. It is interesting to note the fallacy into which many of these writers fall. It is scarcely an exaggeration to say that their explanation is guided by this precept: If the motive assigned for an act is praiseworthy or ordinary, it is a rationalization; if it is base, and particularly if it is sexual, it is a real explanation. The truth of the matter is that in most Freudian explanations there is about as little demonstration of a real causal relation as in the case of the most ordinary good reasons. For example: An individual is a radical. The psycho-analyst decides that the individual in early childhood built up a hatred toward his father. Hatred of the father implies hatred of parental authority and this, it is explained, readily leads to hatred of all authority. The trouble with this explanation is that we have no scientific evidence of its validity. Many children doubtless hate their parents and do not become radicals. And in the case of many radicals there is no reason at all for believing in such a process as that outlined. Such a psycho-analytic interpretation may or may not be true in

particular cases. Our criticism is a criticism of the unscientific method. A similar criticism we believe can be brought against most of the theoretical conclusions as to motives.

Out of our discussion of the scientific view of causation the principal lesson we may draw is the necessity for placing our emphasis on *facts and their inter-relation*. The scientific study of motives or, more generally, of the causes of action has as its task the discovering of facts that can be demonstrated to be related to the activities which are to be explained. The motives may be near or remote, superficial or deeplying, few or many, readily available or almost inaccessible. The important thing is that any really useful study of motives must bring to light certain definite and specific facts as causal explanations. Nothing is gained by substituting the name of an instinct or desire where there is a blank in our knowledge of facts.

STUDYING MOTIVES BY INVESTIGATING FACTS

We may begin the study of the causes for a particular act by asking what causal factors are present in the immediate determination of the act. All psychologists would probably agree that these determining causes are entirely included in two classes: (1) the total make-up of the individual and (2) the total stimulating situation in which he finds himself. The disagreement in regard to motives arises with respect to the nature of the individual's make-up and the part played in activity by the several elements in this total organization of the individual. Different writers emphasize reflexes and habits, appetites and emotions, conscious desires and feelings, instincts, complexes, dammed up nerve energy, bodily sets and attitudes, and many other factors. Likewise different

writers have very different notions as to the origin and development of the several factors. Some would go to heredity for the causes of most activity; others would emphasize the social environment to the exclusion of all else; still others would make the experiences of infancy most important.

The view of motives which we have developed clearly makes it unnecessary for us to choose from among these various alternatives. They may conceivably all be real and usable causes of action. We believe that *any* factors—physical or mental, past or present—may justifiably be considered causes, granted only that they can be isolated and correlated with the act to be explained. The important point is not to decide in a theoretical fashion upon certain of these explanatory factors and then use these in explaining all behavior, but to start out with a scientific method and an open mind as to what particular sort of motives or causes will be useful in accounting for specific acts. If the expressed desires of an individual enable us better to understand his actions, these will be our motives; if observations of his behavior serve our purpose, they will be used; if facts concerning his parentage, experiences during infancy, or what not, prove revealing, these likewise we shall value. But always, the explanatory cause must justify itself. Its causal relation must be demonstrated and not assumed.

We shall indicate in the remainder of the paper two or three specific problems showing the method of attack which grows out of the point of view that has been developed. Our methods are, as a matter of fact, those that any concrete scientific inquiry into the causes of action must necessarily follow. There has been a marked discrepancy between the theorizing about motives and the actual investigations

made. We are attempting merely to bring the general conception of motives into line with sound practical procedure.

Our examples will be taken from the field of workers' motives. One of the most common inquiries is that concerned with the motivating factors that lead to increased or decreased productive effort. One kind of answer talks much of economic motives, creative instincts, and the like. Another sort of answer, and the one we would give, says frankly: We know very little about this matter and it is extremely difficult to obtain clear facts that throw light on the activities. However, we can collect some concrete evidence which will be helpful, and as we amass more and more such evidence we shall gradually have our answer as to motives. We shall study the influence on the productive efforts of workers of such factors as hours, method and arrangement of wage payment, the age, schooling and nationality of the workers, the kind of work, the kind of management, the extent of organization among the workers, and so on through a wide range of facts. We shall study these relations by comparing different groups and different plants, by comparing results under changed conditions in the same plant, by detailed study of the feelings and attitudes of individual working people and by any other scientific methods that we may hit upon.

We are likely to be told that this is all very fine but it is not a study of motives. Our reply is that it *is* a study of motives according to the view of motives we have presented. We believe it represents the only sort of fruitful inquiry into motives. To say that factual studies of this kind are not studies of motives is to imply a mystical conception of motives which sees them as special inner driving forces which are more than mere formulations

of observed causal relations among acts and the events associated with the acts.

Let us carry out in a little greater detail another example in the field of workers' motives. We wish to know, in a particular plant, why the men are leaving their jobs—the causes for the labor turnover. We could, of course, say, "instinct of migration," "thwarted instinct of workmanship," or the like, but that would leave us precisely as wise as we were. What we need is a body of facts regarding the men and their work, and a study of the inter-relations of these facts which will give us an understanding of how important various items are in relation to the turnover. One retail store, for example, experienced a reduction in labor turnover from 700 per cent to about 300 per cent in one year, following the introduction of two changes in employment practice, one in the method of training new employes, the other, summer Saturday-noon closing. Facts of this sort, supplemented by such inquiry as will make sure of the constancy of these correlations, tell more than pages of abstract theory.

The reasons for leaving that are assigned by employes during a final interview have some value, but they must be carefully and critically handled. The typical list of reasons for leaving is unreliable in part because of deliberate falsification by the employes who are quitting work, but much more by reason of the inability of these individuals to say what the causes for their leaving really are. In complexly determined acts of this kind it is tremendously difficult to separate true explanations from rationalizations or fictitious explanations and from real but relatively unimportant items. It is almost as difficult for the individual concerned as for some one else. Very frequently, if we are frank with ourselves, we are compelled to admit we do

not know *why* we did as we did. The individual has to decide what his own motives were through a consideration of the correlated facts, just as does an outsider. Sometimes he can do it better than the outsider and sometimes less well.

We may use statistical and experimental methods in trying to get at the reasons for leaving. We may tabulate and study many sets of facts regarding the individuals who leave—their sex, age, education, nationality, marital status, number of dependents, length of service, number of previous positions, efficiency records, psychological test scores, wages and so on. Or we may experimentally vary some of the factors such as wages, hours, or conditions of work. When comparisons are made with similar facts about workers who do not leave, or with conditions before the experimental changes, some of the factors may prove to be significantly related to turnover and hence be taken as determining causes (or as motives if they happen to be thought of as implying corresponding desires). Thus if it is found that the individuals who tend to leave soon are ones with no dependents, who have held many positions, who have been lax in attendance, have been reported as restless and independent by the foreman—*these* are the significant facts to know. One can read a "nomadic impulse" or "wanderlust" or what not into the facts, but it adds nothing to the facts and it is likely to mislead.

The motives of the individual worker may be studied in an analogous fashion though with greater difficulty. Employe Y leaves and states as his reason that the work is too hard for him. Is this the real motive or is it not? If not, what *are* the significant motives or causes? The answer must depend upon a canvass of the facts about Y. If he takes another job of the same sort

somewhere else, we may infer that the strenuousness of the work was not a very important cause for his leaving. Or if he was physically sound and active and the work was comparatively easy, there is a presumption against the assigned motive. Obviously many different bits of knowledge might lead to the same conclusion, or all the available facts might still leave us uncertain. In so far as facts do not answer our question, certainly instinct-explanations will not.

If we try to go as far as we can in the present example, we may find our answer in such causal relations as these: (1) Perhaps we learn that this man had been only temporarily laid off from his regular job at another plant and that now he is returning to that job. (2) Investigation may reveal that he had gone into debt with shopkeepers and that he left town immediately, without paying his bills. (3) We may find that this worker has the reputation of being highly independent and of resenting strict supervision. Such estimates of character traits are short-hand generalizations of the individual's typical ways of acting, and hence are loosely equivalent to the detailed facts of his behavior. The job in question, let us say, is closely supervised by a foreman who likes to exercise his authority. If other facts bear out this relation, we may decide that this set of facts constitutes one important cause.

We might go on with numberless examples of the same kind. Many concrete and elaborate studies have been made of conditions affecting the efficiency of workers and of the factors causing labor turnover. All these studies are contributing to our knowledge of motives. In fact any scientific collection of data bearing upon conduct and the influences shaping that conduct is a study in motives. Or at least it throws light on the questions which

are ordinarily called "the problem of motives."

SUMMARY

Our main point of view may be stated once more. We have maintained that the study of motives means the study of concrete facts related to activity and the inter-relating of those facts. The methods of studying motives are the universal methods that science uses in collecting and interpreting facts. Sound generalizations concerning motives can be nothing more than formulations of established correlations among observed facts. If this point of view is adopted, the answer to the problem of motives is seen to depend upon all sorts of factual investigations in psychology and in business.

REFERENCES

The best literature on motives is to be found in the technical journals. Among the books, the following may be mentioned:

For discussions in terms of instincts, see:

Wm. McDougall, *Introduction to Social Psychology*.

Carleton Parker, *Casual Laborer and Other Essays*.

Ordway Tead, *Instincts in Industry*. (This book contains a wealth of illustrative material from the industrial world.)

For critical discussion of instincts see:

C. C. Josey, *Social Philosophy of Instincts*.

For general approaches to the psychology of motives, consult:

Z. C. Dickinson, *Economic Motives*.

R. S. Woodworth, *Dynamic Psychology*.

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E. B. Holt, *The Freudian Wish*.

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A. G. Tansley, *The New Psychology*.

The Irrational Factor in Human Behavior

The "Night-Mind" in Industry

By ELTON MAYO

MAN'S pride in the achievement of the last few centuries tends to conceal from him the fact that the human mind and the social organism are still very largely uncivilized. The domain of reason and understanding is extended but slowly; primitive passions still obscure and go far to determine every social issue. One does not need to point to the events of the past decade, or to the situation in Europe now, to illustrate this; it is sufficiently obvious. "An emotion is the less," said Spinoza, "the more its cause is seen to be necessary." Civilization cannot be held to have attained so dispassionate an attitude as yet. Social development has intensified emotions and multiplied the occasions of emotion; the right ordering of emotion is a task but little advanced.

Nowhere is this fact more clearly illustrated than in the industrial field. If some inorganic material prove obdurate to industrial process, we employ chemist and physicist to discover why. But should the human material of industry prove obdurate to factory organization, we usually lose our tempers and stamp about breathing forth threatenings and slaughters. In the one case we endeavor, with careful patience, to discover what unknown causes defeat our purpose. In the other case we appeal all too often to primitive force, talking darkly of conspiracy the while. It is a strange inconsistency. We have long since ceased to smash inanimate things when they happen to displease us. But we still apply the primitive method to our brother man.

We do not, of course, always handle human situations so crudely. If the problem is serious, or the stress sufficiently great, we abjure the luxury of anger. During the war, for example, the Allies developed excellent methods of insuring a high morale in the fighting-line and factory. Military leaders speedily discovered that "shell-shock" was a mental condition that required medical treatment rather than punishment. It was not due to cowardice but was the inevitable effect of abnormal living conditions, overstrain and fatigue. In one classic instance it was discovered that there were more military decorations in the "shell-shock" ward of a hospital than in any other ward.

INDUSTRY'S FAILURE TO UTILIZE HUMAN SCIENCES

But in spite of this really notable discovery of the need to investigate human situations, industry has very generally failed to take to heart the lesson of the war. Defective or mistaken factory organization may be just as effective as war in giving rise to overstrain, fatigue or manifestations of abnormality. There is, of course, less sense of imminent personal danger in industry; but economic fears of another type may be as urgent and overstrain and fatigue conceivably greater. This last claim must be conceded when it is realized that in industry, so far as the individual is concerned, we may be dealing with a twenty-year accumulation of fatigue and disgust and not merely with a two or three-year period. The situation is further obscured by

the fact that the conditions of military discipline, being rigid, serve to force mental abnormality into the open. A soldier who is overcome by fatigue, disgust and fear cannot quit his job and look for another in the preliminary stages of his disorder. Discipline compels him to hold on until an obviously neurotic condition supervenes and he is ordered medical attention. Industry is not so fortunate; it is always possible for a worker to conceal his real ill from himself and from his employers by "desertion." His "desertion" anticipates a "nervous breakdown" and consequently hides the fact that a high "labor turnover" in a particular trade has discoverable causes which remain unknown. This fact I propose subsequently to illustrate.

At this early stage of the discussion it is necessary for me to guard myself from suspicion of prejudging the issue. My claim is not that a high labor turnover or other symptom of industrial discontent is invariably caused by overstrain or fatigue or any other such single or simple cause. What I would point out is rather that when men are "difficult" or "unreasonable" there is always a cause. This cause is usually complex, it is always unknown both to employers and employed; but it is discoverable. A high labor turnover, or a strike, is primarily a social and industrial ill; the former is a chronic malady, the latter an acute one. In either case, the prime necessity is diagnosis and treatment, investigation and remedy. Once this attitude is generally adopted, we shall hear less of unrest and subterranean conspiracies; there will be less conflict and more progress. That there are underlying and unknown human factors in the situation is true beyond all doubt. But these factors are not, to any extent that matters, of the nature of subtly

conceived conspiracies. This applies to both sides in the controversy. "Capitalist" and "Bolshevist" conspiracies exist mainly in the minds of those who bring fear and anger to bear upon the problem, rather than dispassioned thought. Diabolism is chiefly a bogey created by the terrors which still lie near the surface in civilized thinking.

LABOR'S FAILURE TO UNDERSTAND ITS OWN ILLS

The caution I have voiced with respect to prejudging the issue must be applied not only to the possible causes I have named but also to that desire for higher wages or more money, which is usually given as the cause of labor unrest. Workers themselves frequently diagnose their ill thus; their employers and society at large generally accept the diagnosis. That the desire for more wages plays some part in the situation must be admitted. But there are good reasons for doubting whether it is the only, or even the most important, factor. Demands for higher wages are constantly made the world over. Yet in many industries it has been found that the majority of workers refuse to earn more than a certain total income. This applies equally to miners and to insurance agents in charge of a district. Once his total earnings reach a certain sum, the average individual prefers to limit his work rather than to increase his income. It would appear, therefore, that the desire for increased financial resources achieves satiety relatively quickly. But this satiety, when achieved, does little or nothing to abolish labor unrest. A labor situation I was once asked to investigate in an American factory provides an excellent illustration of my point. The employers were of a most enlightened and humane type; the factory was ex-

ceedingly well organized and successful from the standpoint either of production or of morale. Four financial "incentive" schemes were in operation and were working well. The labor turnover in the majority of departments was low, about 5 or 6 per cent; but in one department the turnover was excessively high. "Efficiency" experts had been consulted but in vain: every year at least one hundred hands were taken on in order to keep approximately forty working. With the detailed problem that revealed itself, I shall deal subsequently. It suffices here to point out the definite limitations of the "financial incentive" plan. Given that more fundamental difficulties exist, the mere application of financial incentives to stabilize turnover or to improve quality of work is futile. A thoroughgoing investigation is needed, and in every instance, before an employer can be sure that financial remedies will avail him anything. The initiation of incentives of this type is frequently the outcome of ignorance and despair: "we don't know what's wrong; let's try an increase of wages." The situation in the Australian sugar industry provides another probable illustration of the same difficulty. Some years ago the colored Kanaka laborer was abolished in deference to the "White Australia" policy. White laborers took the place of the colored man in the sugar fields—without any investigation of the physiological or psychological effect upon the white man of work beneath a tropical sun. Since that time the sugar industry has been incessantly disorganized by strikes. These strikes are usually accompanied by a request for higher wages, in spite of the fact that satiety has already shown itself in the form of a tendency to desultory working. This again suggests that the concentration of employers, employees and arbitration

courts upon the wages question is mistaken. What is probably wanted is knowledge that none of the interested parties and arbitrators in conference possess, namely, knowledge of the ideal conditions of work for white men in the tropics. It would seem that no wage-rate, however high, can possibly bring content to the worker until the relevant physiological and psychological facts are made the basis of the industrial plan.

DIAGNOSIS BY SCIENCE VERSUS DIAGNOSIS BY DISCUSSION

These considerations make one doubtful also of the ultimate value of Whitley Councils, the "Plumb plan" or, generally, the principle of democratic control in industry. Recently I was fortunate enough to be present at a discussion of the value of industrial councils on which management and employes are both represented. The discussion occurred at a conference of some twenty employers and high business executives. The opinion seemed to be unanimously in favor of such councils and one had no difficulty in recognizing and admitting the excellence of the achievements claimed. In one case an employer of over seven thousand persons pointed out the results that had followed the education of workers' representatives in problems of economics and business management. Another employer pointed out the educative effect upon himself and his colleagues of a direct acquaintance with the problems of the employe and with the worker's point of view. Any means which will tend to interest the worker more directly in his work, which will tend to give back to the worker something of the economic freedom and autonomy of which the industrial revolution deprived him—anything of this sort is not merely excellent, it is also necessary. I do

not wish to deny the enormous value of representative councils considered from these two standpoints. It is when this form of council is proposed as a sufficient remedy for labor unrest that one cannot but be doubtful. In the majority of instances of high turnover or definite unrest, the worker has as little notion of the real ill he suffers as an individual afflicted with melancholia or nervous breakdown. To put the matter in extreme form, it seems that conference between ignoramuses is as little likely as is conflict to provide a real solution of the problem. This is, of course, an over-statement; but I make it deliberately in order to call attention to an aspect of the situation which is unduly neglected. If an individual is afflicted with typhoid fever we do not call a conference of his relatives and a few representative politicians in order to decide, in a carefully democratic fashion, what shall be done. We send for a physician, arrange for a blood-test, and expect the man of skill to prescribe such treatment as is required. The two cases are not exactly parallel, but the analogy will serve to indicate how large a part is played by ignorance in our methods of handling labor unrest. In the average instance, labor unrest would be easy to handle if the worker knew what was really wrong. The fact that no one knows the cause and that no one adopts the proper method of discovering it—these are the considerations that urge us to look over the possibilities of psychological investigation.

PSYCHOLOGY AS THE STUDY OF ORGANIZED PERSONALITY

Psychology has a history that runs through several centuries, a history of quiet development in university, school and clinic. For long remote from the affairs of men, psychology has recently shown a capacity for stepping out into

the turbulent market place, for illuminating with understanding the human aspect of the transactions of the market. Than this, no illumination is more necessary; civilization has failed to study sufficiently its more human problems.

It is not every piece of psychological research, of course, that is immediately applicable to business and industry. The scientist working in his laboratory can rightly put on one side many characteristics of the human mind as irrelevant to the specific study upon which he is engaged. But this is no longer possible when he comes to apply his knowledge to social and industrial affairs. The problems of business are not merely scientific, they are human. And the psychologist must see that no element of the complex human problem is neglected. Over simplification in this respect caused the downfall of the political economy of the eighteenth and nineteenth centuries. It has already brought to nothing many enthusiastic and valiant endeavors to create an applied psychology.

It is well to be clear upon the point. Certain aspects of the common life of man may be capable of being described in terms of a "stream of consciousness," a "conditioned reflex" or an "instinctive urge": but man himself is more than any or all of these things. It is with man as a totality, the individual in his social relations, that we are dealing in business and industry. All the various minor researches contribute something to our knowledge of the very complex individual, but there remains a need for a general point of view, a broader psychology which will enable us to assign to each minor research its true importance and to estimate whether or no the tale of inquiry is complete.

This has been the special excellence of recent work in "behaviorism" and psychopathology. Sherrington's in-

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investigation of the integrative action of the nervous system, Watson's study of the conditioned reflex in infants, Holt's discussion of "situation" and "specific response"—all these inquiries have made it clear that every lesser thought or action is a product of the total mind or consciousness of the individual. The psychopathologist in his clinic has made a similar discovery. The defective attitude toward life which is described as nervous breakdown does not reveal itself immediately in the ordinary thoughts and actions of the patient. It is revealed, of course, in the patient's melancholy conviction that such thoughts and actions are without value. But this is merely symptomatic; no amount of direct argument or persuasion conducted upon this level will amend the patient's condition. The real ill lies deeper; it is a fundamental disorientation to life, or disintegration of the personality, which shows itself in a general disordering of values. It is the "total situation" which is defective in all instances of nervous breakdown. Whether an individual is mentally normal or abnormal, his particular thoughts and actions are determined by his total mentality, his total attitude to life.

IMPORTANCE OF UNDERSTANDING THE "TOTAL SITUATION"

So also with industry or business. We cannot argue from "instincts" or "urges" or "motives" to industrial problems. These names no doubt denote aspects of the individual human, but they do not include the man; they remain merely aspects. To confine ourselves to such studies would mean that we had excluded the human factor in industry, that is to say, the man himself, from proper consideration. The failure which often attends the application of financial incentives to

the solution of problems of labor unrest provides a practical illustration of this fallacy. Our study must begin with the individual and not with classified motives or categories to which we have arbitrarily reduced him. To put the matter in a word, we may say that the study of "total situation" is fundamental in all applications of psychology. This is as true for the factory as it is for the psychiatric clinic; only when we have investigated the total situation of an individual can we know why he dislikes all foremen or believes himself to stand in special danger from falling meteorites.

Now the phrase "total situation," used as a technicality of psychology, may sound alarming. It is not really so; all that it means is that the "setting" or background of a thought or thing counts for as much as the thought or thing itself. If a suburban hostess were to walk into her drawing-room clad only in a "one-piece" bathing costume her visitors would think her insufficiently dressed and would probably conclude that she was mentally disordered. They would draw no such conclusion upon the summer beaches; yet the only difference between the two situations is a difference of background or "setting." It is not so much the thing we see that determines our thought, it is rather the background against which we see it. *And for every individual this background is different.* Although in actual fact the same for everyone, the world about us is nevertheless interpreted by each of us in the light of his past life and previous experience. The dislike and the fear that I referred to in the preceding paragraph were characteristic of two actual cases. The behavior of an artisan was dominated by an irrational dislike of his "bosses." The behavior of a professional man of high ability was dominated by a secret fear

of being hit by a meteorite. The irrational dislike of persons set in authority revealed itself on investigation as an infantile attitude which had persisted in adulthood. The fear of meteorites also had an infantile history but was mainly caused by an unsatisfactory domestic situation. In both cases discovery of the cause in the total situation of the individual, combined with the appropriate reëducation, had the effect of abolishing the obsessive emotion.

UNREST A SYMPTOM OF MENTAL DISORGANIZATION

What "total situation" means is that we are passively conscious of a wide world while we are actively thinking about a small part of it. In every individual the passive consciousness reflects the experiences of a lifetime—success, failure, happiness, pessimism. It is the wider consciousness which determines both our thought of the lesser object and the next direction of our interest. Any defect in our total attitude is reflected in the passing thought and in the habitual direction of our interests. The two instances quoted above are of importance not merely as demonstrating the fact that study of an individual's total situation is fundamental in psychology; they show also that there is a real identity between labor unrest and nervous breakdown. Both in the psychiatric clinic and in the factory the eccentric idea and the flare of emotion are symptomatic. In themselves they cannot be understood; account must be taken of the individual's mental hinterland, his total situation.

In studying the individual, therefore, the first fact for the psychologist and for the business executive is not that "thinking goes on," as William James said; it is rather that an individual's ideas and actions are

symptomatic. Everything a man says and does is the product of, and gives expression to, his total consciousness. The fact that his various ideas and actions betray inconsistencies is of the profoundest interest; it shows that his total consciousness or mind is not well harmonized, that there is a degree of disintegration or dissociation.

This relative disharmony is characteristic of the average normal person, and it is not difficult to see how it originates. At birth the infant mind is not individual; it is a sample or specimen of the race. Individuality is developed as life proceeds by means of experience and training. Happiness, sanity, success, mental harmony—these things are indicative of a successful compromise between the demand of life made by the racial self and the conditions of living imposed by the environment. Our mental capacities are originally racial; the life we lead must recognize the existence of such capacities and provide them with means of direct or indirect expression. At birth we are neither sane nor insane; sanity is a mental condition we achieve or miss. (?)

Regarded thus, sanity or normality is an ideal which no one quite achieves. This relative failure, however, does not justify Fielding's contention that the primitive cave-man lives on behind the scenes in every mind. The fact is that racial capacities force themselves into expression by one road or another. If life provides a sufficient variety of avenues of expression, the individual is possessed of average normality. If life is unduly restricted, racial capacities develop themselves in revery or daydream and express themselves in nervous breakdown. This is the important discovery of recent years in the psychopathological clinic. It is a fact of even greater importance in the factory. Modern methods of machine

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production are monotonous; long periods of revery-thinking are made inevitable. Life in a city slum and long hours in the factory combine to make such reveries pessimistic or melancholic. Socialism, Syndicalism, Bolshevism—irrational dreams of anger and destruction—are the inevitable outcome. As theories of society or social science these movements are of small importance. As symptoms of a human need, as evidence of the failure of civilization to study human problems, these expressions of working class feeling are of the first order of value.

THE DAY-MIND AND THE NIGHT-MIND

The civilized mentality does not differ by much from that of the savage. In both we find that the total situation is dominated by a marked dissociation. Certain thoughts and activities are controlled by the "day-mind"—the product of concentrated thinking and disciplined revery. Certain other ideas and actions are controlled by the "night-mind"—the product of unacknowledged reveries and the minimum of concentration. In the child the distinction is clear cut. A small boy, threatened playfully by an adult with a Malay Kris or heavy stabbing knife, showed no fear during the day and continued his game. But for months afterwards he was subject to terrified dreams at night of pursuit by a man with a Kris. Another child, traveling with his father, met a hunter whose wrist had been crushed by a bear. At night they stayed in a hotel the hall of which was filled with stuffed bears. The child showed no fear until he had been in bed for an hour. Then he woke screaming that bears were after him, and could not be pacified.

The day-mind and night-mind are not actually two, of course; they are

two aspects of one and the same mind. Concentration and reason are responsible for the one development; revery and unreason for the other. The savage belief in magic and tabu explains itself as the product of revery and unreason. Man stands in constant need of reassurance from the age of three onwards; and primitive man tends to retain his childish outlook. Faced with a world which he does not understand, the savage dimly realizes his impotence. This terrifying fact, though implicit, yet dominates his total situation; the wide world of unknown possibilities is the persistent background of his every thought and act. He has to counterbalance or compensate for the implied threat against him, before he can give his attention to the minor needs of the day. So magic—the pretense of control by rites and ceremonies where no real control exists—comes into being. Witchcraft and sorcery, reassurance without understanding, are the typical expressions of the night-mind. The problem of civilization is to extend the area of understanding and to diminish the area of night-mind control.

But civilization has not yet succeeded. It has assumed the allegiance of humanity to science and has failed to realize that even people of education, in the ordinary sense, are still far more dominated by magic and the night-mind than by clear thinking. The miners of West Virginia will not work if a woman is taken through the mine; if they do, they expect an accident to happen. The persistence of a superstition in this social stratum may seem natural enough; what we fail usually to observe is that as many instances of belief in magic are to be found in those supposedly higher social circles where the leaders of society move. An Episcopal clergyman of my acquaintance carried a potato in his pocket for

many years to ward off attacks of rheumatism. I have known many British business executives who habitually wore iron rings for the same reason—to prevent rheumatic troubles. A university basketball team must walk onto the field in the same order in every match, otherwise some player will "lose form" and play badly. Patent medicines are widely preferred to medical advice; their effect is "magical." It is evidently not only the heathen who "in his blindness bows down to wood and stone." Apparently any one of us, civilized or savage, if he is faced with a situation which he does not understand, tends to improvise a magic substitute for understanding which shall ease and reassure his mind. The difficulty is that the tendency is never confined to the single instance. Insofar as an individual is dominated by his night-mind he prefers ignorance and magic; a known remedy is of limited efficacy, an unknown remedy is of unlimited efficacy. The night-mind plays a very large part in our social, political and industrial affairs, a part that is too little realized, or taken account of, by social science.

THE NIGHT-MIND IS ANIMISTIC

A belief in the efficacy of magic and sorcery is not the only character of the night-mind; it is also curiously animistic. Being the product of unacknowledged reveries and therefore irrational, it makes no use of scientific notions of causation. To the night mind all disasters are personally caused. The savage does not regard death in any circumstances as natural. Guided only by his night-mind reveries, he believes that a death is always the result of sorcery, that it is contrived by some person or persons. In West Africa when a white man dies, his negro valet always disappears for at least a week. He takes to the forest

and stays there until such time as the magic which has slain his master may have dispersed. If ills can be abolished by magic, ills can also be caused by magic; so the savage attributes all his troubles to the incantations of a hostile sorcerer. One finds the same night-mind attitude, the belief that all ills are the result of personal contrivance, persisting in the industrial disputes of civilization. There are dissatisfied workers, the world over, who claim that their miseries are definitely contrived by the "capitalist"; they object to civilization on the ground that it is a conspiracy to exploit the worker. There are employers of labor also who exhibit a similar mental outlook; in the clubs which they haunt, Socialism and Bolshevism are spoken of as working class conspiracies against the social order. We cannot expect the industrial situation to improve greatly while so few of those most concerned are trying to discover the real situation. Ignorance, stupidity and the night-mind are far more real causes of industrial difficulty than conspiracies to destroy. If psychology were to confine itself to investigation of the human situation in industry, to elimination of superstition, delusions of conspiracy and unnecessary hatred—if psychology were to do no more than this for the next twenty years, it would still be possible for it to make the greatest contribution to civilized progress that any science has made.

PSYCHOPATHOLOGY IN THE WORKSHOP

It has been difficult to formulate my thesis that industrial organization of the present is insufficiently adapted to human needs, that being ill-adapted it fosters the growth of neurotic reveries and night-mind control. Fortunately my thesis, though difficult to formulate, is easy to illustrate. The illustrations I use are all taken from my own experience.

The psychologist in industry who desires to go beyond the superficialities of intelligence testing, vocational guidance and the like, has to face serious difficulties in the matter of approach and method. There are those who advocate that the observer should work side by side with the men. This approach would seem to be unnecessary and of small utility, first, because the men never know the real ill they suffer and, second, because a merely temporary worker cannot expect to rouse in himself the same feelings to his superiors and his job as those of a permanent "hand." For this reason I was guided in my first approach by experience of psychopathological clinic and "shell-shock" hospital. The event proved that there is an extraordinary resemblance between a "shell-shock" hospital and a factory where the morale or will to cooperate is low. In a factory where the morale is low the incidence of hysteria is high. In one such factory, for example, I encountered the cases described below. These are not selected cases; I have listed them as they came to me. It must also be remembered that every individual was leading a supposedly normal life, fulfilling a daily routine of work and was regarded as possessed of average normality by his fellows.

1. A skilled machinist of European origin who fears the conspiracies of unknown persons against his life. The secret mental life of this individual is much occupied with these fears. He is a good workman and stands high in the opinion of his employer.

2. A laborer, European origin, whose head aches every Sunday punctually at noon. Sober and religious.

3. Three skilled machinists of high standing in the factory who are

bitterly hostile to the present industrial régime. This hostility does not show itself in their work or conversations, but seems to possess their reveries to the exclusion of all else. Intelligent and decent members of society.

4. An elderly mechanic who hears an English skylark sing at three o'clock every morning. Eighteen years ago he used to get up at three o'clock occasionally to hear the skylarks sing in England.

5. Two women operatives who are unable to continue work if the men with whom they are associated raise their voices. One is American, the other European. Both had alcoholic fathers who used to shout at them in infancy. The infantile terror of a raised masculine voice has persisted and is developing. One became "engaged" and immediately fell into a condition of nervous breakdown.

These few cases serve to show that in industry, and especially in a factory of low morale and high labor turnover, the situation we have to face resembles more nearly the nervous clinic than the professional workroom. This method of approach is, however, defective, and for three reasons. In the first place, it is so slow that it involves a risk of incurring the suspicion of employer and employee; it is liable to be misunderstood. In the second place, the individual method of investigation neglects unduly the part played by departmental organization within a factory. And, third, in taking account of all the problems of the employee, this method is apt to take too small account of the special problems of the employer.

A PSYCHOLOGICAL APPROACH TO A LABOR PROBLEM

The best method of approach is probably that of taking a preëxisting problem in an industry in order to

attack it from a new and psychological viewpoint. This has recently been tried with results that I shall set down. The problem that most obviously stands in close relation to the psychological investigation is that of labor turnover. This is, of course, by no means the only industrial problem confronting labor managers, but it may be taken as representative, to a certain extent, of other more or less closely related industrial problems, such as those of unrest, dissatisfaction, agitation, reduced production, personal friction, strikes, and the like. Much has been said and written on this topic of labor turnover, much inquiry has been organized; but few so far have carried out an intensive research into the human causes which lie behind the restless shift of "travelers" from one job to another or the inability of certain factories to hold their workers.

Labor turnover is a factor in production which adds enormously to cost. It is unfortunate that no one has yet devised a means of calculating with any exactitude just what addition to cost is incurred thus. It is nevertheless easy to see that the waste of time and materials involved in constantly "breaking in" new workers must be very great. And this "breaking-in" process is not merely an adjustment of the man to the machine. It includes also an adjustment of the man to his fellow workers, his foremen, his employers and the special methods and regulation of the particular factory. Many workers leave before the adjustment has been satisfactorily accomplished. Factory conditions, even within a single trade, are so little standardized that this is almost inevitable. As between one factory and another, different working conditions operate to stimulate labor shifting and turnover. This applies

also to differences in different industries operating in the same locality. Generally it may be said that employers have failed to see or state the problem clearly; this failure adds greatly to their production costs.

An intensive study of conditions affecting labor turnover must include at least three investigations. There is, first, the necessity of selecting the right type of worker for the particular job. This problem is receiving some attention under the general conception of "vocational selection." What vocational enthusiasts tend to neglect is the second problem—that as to the part played by upbringing and psychoneurotic affections in making a worker unfit for any job. A mild degree of nervous breakdown plays a large and unsuspected part in industry. The high incidence of hysteria in a factory of low morale is sufficient evidence that this problem cannot wisely be disregarded. These facts point to the necessity for the third investigation—the question as to the part played by unsuitable working conditions, broadly interpreted, in the creation of labor unrest. How far is it possible to anticipate and prevent the irruption into industry of the night-mind attitude and its consequent ills of agitation, unrest and strikes?

RIGHT SELECTION ONLY A PARTIAL SOLUTION

Now although many employers have come to realize the necessity of vocational selection, there are unfortunately few who understand that such selection cannot succeed if the other two investigations are neglected. I was once asked by the general manager of a factory to devise a means of excluding unsuitable persons, those who were not likely to carry on, from instruction in a certain machine operation. In his conception of the state of

affairs, his high labor turnover was caused by the fact that many workers, after receiving instruction, either disliked the job or were incompetent to go on with it. The figures showed that in five months the factory had taken on approximately one thousand workers in order to keep approximately nine hundred working. In the same period four hundred and fifty had left the factory of their own accord. Turning my attention to the machine-operating department in question, I found that in five months approximately three hundred and sixty hands had been taken on and approximately one hundred and ninety had left the factory. Of the one hundred and ninety, one hundred and seventy-five had left of their own accord. The tabulated reasons for leaving or discharge read somewhat as follows:

Incompetent	6
Disliked night work	79
Objection to monotony	10
Other jobs elsewhere	40

This table did not necessarily disprove the general manager's conception of the situation. It nevertheless made it quite impossible to accept offhand the notion that vocational selection was likely to prove an infallible remedy. Of one hundred and ninety workers who left in a five months' period, approximately one hundred and twenty had stopped work because they disliked night work or had found other jobs. Pushing the inquiry further, we found that the night shift received a special bonus of twelve dollars (\$12) per week in addition to the same piece rate as the day workers. On the other hand, the night shift worked for eleven and a half hours as against ten hours worked during the day. The lunch interval at night was half an hour as against three quarters of an hour during the day. Adding to this the fact

that no one likes night work, it seemed probable that unfavorable conditions of night work were contributing more to causing a high labor turnover than any failure to select the right type of worker. This tentative conclusion was further supported by the discovery that although beginners were instructed during the day, they were put onto night work as speedily as possible. The ten workers who gave "monotony" as their reason for leaving were all beginners. It seemed possible, therefore, that this figure should rightly be included amongst those which suggested the necessity for careful reconsideration of night work conditions. The general manager, however, could not be persuaded to any such reconsideration. He maintained that selective tests were his only need, that his experience justified him in regarding these other facts and figures as of no importance. In this he may, of course, have been right. But no personal assurance, however skilled or experienced the person, could warrant a psychologist in concurrence without further investigation.

An investigation in a textile factory proved more fruitful. This factory is remarkable for the enlightened attitude of its directors towards labor problems. It is remarkable also for the high morale which obtains generally in its various departments. Four "incentive" schemes are in operation, schemes designed to secure a spirit of coöperation in the workers. These comprise two bonus schemes, an insurance scheme and a scheme to encourage saving. In spite of these devices, the labor turnover in the spinning department was, at the time of investigation, unduly high. Whereas the general labor turnover of the factory in other departments was estimated at 5 or 6 per cent per annum, in the spinning department it was estimated by one

executive authority as approximately 250 per cent.

MENTAL EFFECT OF MONOTONY

Inquiry showed that the problem of a high labor turnover amongst operators of spinning mules was not confined to this particular factory. It exists generally throughout the trade; spinners and piecers have, in fact, an unenviable reputation amongst employers. They are also said to be prone to leave their employment in sudden fits of anger and disgust. This last fact suggested the existence of semi-melancholic reveries culminating in paroxysms of rage. Taken in conjunction with other features of the situation, it indicated the need of closer study.

On a first glance, the conditions of work in the department did not seem noticeably inferior to conditions of work elsewhere in the factory. Spinners work on five days only in the week. Formerly the factory worked on Saturday, but for some time this has been discontinued. The working day is ten hours in length, five hours in the morning and in the afternoon; there is an interval for lunch of three quarters of an hour. The work is done in long alleys on either side of which a machine-head is operating spinning frames. The number of spinning frames operated by each machine-head varies from ten to fourteen; all these frames have to be watched closely by the head-tender and piecers in charge.

The number of piecers in an alley varies according to the kind of yarn that is being spun; the distance between the terminal frames at each end is from 30 to 35 yards. The work is monotonous; the piecer walks up and down the alley twisting together broken threads. The only variation in work is that which occurs when the machine-head is stopped in order to replace a spool. "Break-downs" are fairly frequent.

After watching the operation for some days, I came to suspect that the work involved a high degree of physical and mental fatigue. Workers of thirty-five years and over did not compare well physically with younger workers on the job; men of forty and over were, indeed, ill-nourished in appearance. The footgear of the majority, old and young, indicated that much thought, of a revery type, had been given to the condition of the feet. Some workers wore boots, others slippers; some had slashed their shoes across "for ventilation"; others wore shoes tightly laced. One worker asserted in my hearing that piecers "walk long distances, at least twenty miles a day." I timed piecers of various ages in different alleys and found that a mile per hour, or ten miles per day, was a liberal allowance for distance actually covered. The problem seemed to be a problem of posture rather than exertion. The workers have to stretch forward over the frames for probably one third of the time that they are actually working. The problem of posture and fatigue resolved itself into three questions which had to be answered as best they might. These questions were:

(a) What effect had awkwardness of posture, without effective relief, upon the postural tonicity of muscles?

(b) What effect upon relative blood pressure in the respective zones?

(c) To what extent was physical fatigue causing semi-melancholic revery?

These questions could not be directly answered. A mere visitor in a factory has no right to ask a worker to pull off his shirt and display his muscular condition.

General conversation with the men, and carefully directed discussion, speedily provided us with evidence of an indirect nature. The following

assertions were made, and repeated many times, in my hearing:

"You need strong legs for this work."

"It's the walking and the breaking threads."

"Old men work faster than young ones. But they get tired of walking much sooner."

"I get tired in the legs. Even after two years I still get tired in the legs."

These assertions were not made in reply to direct questions. They occurred in conversations, and recurred as commonplace observations with respect to spinning. Many men also complained of swollen and perspiring feet. This made it seem likely that a relative incoördination of blood pressure was causing physical fatigue. Certain specialists in physical medicine, whom I consulted in the matter, strongly confirmed my suspicions. One such specialist called my attention to a practice in the French Army: On long marches the soldiers are given periodic ten-minute rests with the feet raised in order that differences of blood pressure may be readjusted. The result is that the French soldier can march farther than any other, and with less fatigue.

In the course of conversations with the men, I discovered also that very many laid claim to "neuritis" in various localities of arm and shoulder. Indications pointed to the conclusion that this alleged neuritis was in certain instances similar to that of the hysteric. That is to say, it was symptomatic of inability to relax a partially fatigued muscle, or of muscular dystrophy of an occupational type. Our racial inheritance has something to say with respect to our muscular as well as our mental development. The individual whose muscular development does not approximate to the racial and predetermined muscular relation is very apt to suffer unexplained "muscular rheu-

matism" and so-called "neuritis." It is probably this form of "rheumatism" which is corrected by physical culture.

The suspicion that inability to relax partially fatigued muscles played some part in the situation was further supported by the discovery that generally amongst spinners the incidence of alcoholism is high. This applied not specifically to workers in the particular factory but widely through the trade. The incidence of alcoholism is usually high amongst those who desire, without knowing what ails them, to take the shortest road to complete muscular relaxation. Generally it may be said that the investigation of the muscular condition of "shell-shock" soldiers applied very directly to workers in the spinning alley.

In addition to all this, there was much evidence that the situation was exacerbated by the emergence in the workers' minds of pessimistic reveries. Such assertions as the following were common:

"You need strong legs and no brains for this work."

"You think about other things."

"Piecers get disgusted—they are always getting disgusted."

After lengthy discussion of the evidence and the situation, the general manager decided to institute three ten-minute rest periods in the morning and afternoon. In these periods the workers were to lie down with their feet raised and to practice muscular relaxation. It was expected that the effect of six such rest periods would show itself in increased output and diminished labor turnover. The experiment is still in progress. At present it is impossible to report finally. It is certain that the physical and mental condition of the men is greatly improved. There is a high degree of probability that the output will be, at any rate, nothing diminished.

In the same factory, these experimental rest periods have been tried in another department, the "picker-house." The effect here has been unmistakably excellent; fatigue has been diminished, morale notably improved and production has greatly increased. This last has occurred in spite of the fact that one hour of the former work day is now absorbed by six ten-minute rest periods.

A PROBLEM FOR PSYCHOLOGICAL AND PHYSIOLOGICAL RESEARCH

In conclusion it must be admitted that investigation of this type is not sufficiently advanced for broad generalizations to be possible. It may fairly be claimed, nevertheless, that a new and more fruitful attack upon the various problems of labor unrest is gradually opening up. The old method of "collective bargaining" led nowhere but to further dispute and difficulty. In the last resort compromises based upon industrial scuffling are more likely to reduce production than to increase it, more likely to exploit the public than to give good service. These tendencies have both shown themselves in Australian industries.

The fact is that a high labor turnover

always has a cause and the cause is discoverable by the appropriate type of investigation. But neither employers nor employed can name such cause offhand; if they could there would probably be small difficulty. There is need for physiological and psychological investigation. There is need for anthropological estimation of the culture-level of the persons concerned. There is need for determination of the extent to which the night-mind of man (or semi-melancholic revery) is entering into and complicating the situation.

There remain, of course, a few employers who refuse to look squarely at the problem, who declare that they are in business "to make money." It would be possible to write an essay on the extent to which a superstitious veneration for money affords expression, in these latter days, for magical beliefs and practices. It suffices here to point out that the employer who is utterly careless of the happiness and content of his workers is not merely inhumane but is also treading the road to ruin. A high labor turnover, if it persists, will break any industry. We are likely to have instances of this ere long in the present condition of affairs.

Understanding the Consumer's Mind

By HARRY DEXTER KITSON

WITHIN recent times as population has increased and human wants have multiplied, and as indirect relations between buyer and seller have so largely replaced direct contacts, manufacturers and sellers have become aware that the consumer has been slipping out of their ken. They have therefore made efforts to recapture him. Their methods, which need not be thoroughly described here, may be roughly designated by the term "analyzing the market." This market analysis involves a study of everything that can possibly affect the goods either in manufacture or sale, and everything that can be affected by them, including sources of raw materials, labor conditions, means of transportation and competing commodities.

As should be expected, one of the prime objects of interest in this analysis is the consumer himself. For he, among all the unknown elements of the situation, is potentially one of the most active factors and an indispensable party to any plan of marketing. It has then become a truth self-evident to the modern marketer of goods that the consumer should be intently studied. The study is made difficult, however, by several characteristics of the modern consumer:

1. *The Consumer Is Impersonal.*—The first characteristic of the modern consumer is that he is an impersonal being; that is, to the seller he has no personality. The task of the market analyst is to strip him of his anonymity and endow him with personality.

2. *The Consumer Exists in the Mass.*—Whereas the clients of a hat-maker of a century or two ago might number only a hundred, each of them a personal

acquaintance, those of a hat-maker working on a twentieth-century scale of production may number 1,000,000.

3. *The Consumer Is Widely Distributed.*—Coincident with the fact that the consumer exists in mass is the fact that the consumer extends from ocean to ocean. Furthermore, he lives in varied geographical regions. Methods of studying masses of people in a given area have been exploited by various publications catering to advertisers. (See for example, "National Markets and National Advertising," *The Crowell Publishing Company, New York.*)

4. *The Consumer Is a Many-sided Individual.*—If the consumer is to be accurately depicted he must be regarded as a many-sided figure: He is a physical being, possessing a height and weight of some dimensions. He is a physiological creature, of definite age, sex, blood-pressure. He is an economic entity with a determinable capacity for earning, saving and spending. He is a social unit living in a world of family, neighbors and friends. He is an ethical individual controlled by ideals and habits which have been instilled in him by moralistic teaching. Finally, he is a psychical organism who thinks, feels and acts according to recognized psychological principles.

Regardless of the logical and scientific categories under which the various traits of the consumer fall, they may all be concerned to some degree in the purchasing of goods and they must all be made the objects of solicitous study on the part of the seller. As should be expected, these several phases of the consumer's personality are to be reached through several sciences, such as economics, physiology, sociology and

psychology. Though admitting freely the validity and utility of each of these sciences, we shall devote all our present attention to the psychical nature of the consumer and to the use of the science of psychology in understanding him.

STAGES IN THE ACT OF BUYING

The psychological changes that the consumer undergoes in making a purchase are generally conceded to follow a fairly typical course:

1. *Attention*.—There is first a stage when the purchaser attends to the commodity. By this is meant that out of the mass of objects crowding into his mind he selects the commodity to be momentarily the clearest thing. Of course he ordinarily does not do this without some prodding on the part of the seller. He is usually stimulated through the application of the various determinants of attention such as intensity, extensity, change, color, repetition. The unlimited number and variety of ways in which these may be applied challenge all the ingenuity and skill a seller can command.

But to keep one commodity unchanged in the center of the consumer's mind is a difficult matter, for there are a host of other objects constantly assailing him. Furthermore, the mind is such an active thing that it cannot remain still. Like a stream it is ever in motion. Accordingly, if the commodity for sale is to maintain its central seat in the mind, there must be injected another force into the situation. This may take the form of:

2. *Interest*.—If the sale is to continue to a consummation, the initial attention must merge into something warmer, usually known as interest. Though interest is variously defined, it may be truthfully described as the recognition of old familiar elements in an unfamiliar commodity, followed by an attempt to draw nearer and nearer to the

commodity. If an act of purchase be examined carefully from the psychological standpoint this phenomenon will be clearly seen. As the purchaser becomes better acquainted with the commodity he tends to identify himself more and more closely with it, until finally when he buys it he actually comes to consider it as a part of himself, exemplifying the statement of James that one's possessions are a veritable part of the material self.¹

As means of arousing and enhancing interest there may be cited two chief psychological principles: (a) Give facts about the commodity. The facts being mostly new and unfamiliar should be presented in terms of facts already familiar to the consumer. (b) Arouse activity toward the commodity. This recommendation is based on the well-established principle that the more activity one expends on behalf of an object the more interested one becomes in it.

3. *Desire*.—Though interest continues and even waxes throughout the course of a purchase, it leads normally to a state of mind that is best designated by the term desire. This may be briefly described as a complex state of mind consisting of first: A play of the imagination in which the consumer images himself in relation to the commodity; a feeling of pleasantness accompanies this; then come movements, either actual or incipient, toward the commodity; but these movements are blocked by such things as too high price, objections from a third person, ideas about competing commodities, etc. This blockage gives rise to feelings of unpleasantness. If the sale is to be consummated the blocks must be removed so that the consumer may move freely toward the object and acquire it. After they are removed, the

¹ James, *Principles of Psychology*, Vol. I, p. 292 ff.

consumer acquires the commodity, experiences a feeling of pleasantness and thus fulfills the desire.

One of the questions the seller faces at the stage of desire is: How enhance desire? The answer must be couched chiefly in terms of interest, for the same methods that are employed to increase interest will enhance desire, especially if pictures are painted before the consumer's imagination representing the pleasurable aspects of possession of the commodity. Another question the seller faces is: How remove the blocks that impede the free movement of the consumer toward the commodity? The ideational blocks may be removed by the use of arguments and suggestions; the physical blocks may be removed by appropriate remedies that will come to the mind of an ingenious seller.

4. *Confidence*.—Somewhere in the course of a purchase comes a stage that can best be designated as confidence. The consumer must have confidence in either the commodity, the seller, or both, if he is to make a purchase of any consequence. The confidence need not always enter precisely at the point indicated in this outline. It may be present with the initial act of attention or it may develop during the growth of interest and desire, but it must enter somewhere before the final stages of the purchase.

Though confidence is a difficult state of mind to describe, it is probably best classified psychologically as a feeling the essence of which is called by some psychologists, belief. Belief is a sophisticated state usually arrived at as the culmination of a three-fold process: First, a state of "primitive credulity" when, according to a native tendency, one inclines to accept unquestioningly every statement made; second, a period of doubt caused by disappointing experiences with an ob-

ject once believed in; and third, a period of confidence (belief) reached after more or less strenuous efforts of persuasion.

The seller who tries to inculcate confidence within a consumer must be acquainted with the genesis and evolution of belief, and he must employ the several principles that are generally effective in bringing about the desired state of mind. Probably the best method to employ is to give complete satisfaction with every sale. This leaves a feeling of confidence embedded in the consumer's mind which he attaches to the early stages of his next purchase of the commodity. Another device is to give a written or legally valid guarantee. This brings a feeling of satisfaction through insuring that it will be present.

Another device is repetition. Just as constant dropping wears away stones in the physical world, so constant iteration of a sale's message affects the mind of the consumer and makes him believe. It is this fact which gives value to the great amount of publicity certain firms give their commodity. By constantly keeping their name before the public they instill in the mind of the consumer a belief in it. The mere familiarity of the name endows the commodity with a prestige which is in large part confidence.

5. *Decision*.—After the foregoing stages have been passed through comes the stage when the consumer performs the act of handing over the money. This, which in the nomenclature of theoretical psychology is designated as a voluntary act, is usually divided into three phases: (a) the reception of an idea to be acted upon; (b) the development of this idea to a point when it explodes in action; (c) the simple awareness that the act has transpired.

The first event, the entrance of an idea, occurs at the initial stage of the

purchase which we designated as attention. And the process of developing the idea is coincident with the development of the stages of interest, desire and confidence.

The second phase is the veritable act of purchase. It is the culminating event toward which have been directed all the preceding efforts of the seller. This moment, just before the clock strikes twelve, often called the psychological moment, is one of the most interesting points of the entire purchase. Though a complete treatment of it cannot be attempted here, a few descriptive statements may serve to indicate its character and suggest means of handling it. First should be recognized the fact that an idea, such as that which starts off an act of purchase, has great power resident within it. As stated in the "law of dynamogenesis," it has power to evoke an act appropriate to it. On this assumption it would seem that when such an idea is once injected into the mind of a consumer it should emerge immediately in the act suggested. It does not usually do so, however, for besides the idea suggested by the seller there are other ideas in the mind of the consumer, each one capable of initiating action appropriate to itself. Accordingly, the task of the seller is to remove the ideas that conflict with his idea. Take, for example, the sale of an automobile. The buyer, by entering the salesroom, shows that he is entertaining the idea of buying this particular car. But there are many other conflicting ideas in his mind at the same time. The task of the salesman is to eliminate the undesirable ideas.

To a superficial view the task of the salesman might seem to be that of taking hold of these unwelcome ideas and thrusting them into outer darkness, but such a conception is erroneous and will lead to egregious error. If the mind of the buyer con-

tains the idea of another car, the proper procedure is not to dilate negatively upon that car in the effort to drive it out of mind. Every word uttered about that car acts as food for the unwelcome idea and causes it to wax stronger and stronger. The practice of criticizing or condemning a rival commodity is being recognized as poor business ethics, but we may go still farther and say that to speak either in praise or blame of rival goods is poor psychology, for every word makes the undesirable idea still more troublesome.

What are the methods, then, by which the undesirable ideas may be forced out of the mind and the desired one enhanced? The answer is to force attention upon it; when this occurs, the strength of the desired ideas automatically decreases. The psychological situation may become clearer when conceived in terms of brain energy. The brain, according to some psychologists, is organized into a number of ideational systems, one for each idea that exists in the mind. Any ideational system may be roused into action by the drainage into it of brain energy. Now the energy of the brain may be distributed in various amounts over different systems, the amount in each system depending on the strength of the corresponding idea. In the case of a purchase, if the main idea is to grow in strength, its brain system must draw off from the other systems the brain energy resident within them, until the energy of the brain is all drained off into the one system, which means the triumph of the idea.

The process consists in using concrete facts regarding the car: the power and smoothness of the engine, the luxurious ease of the springs, the elegance of the upholstery. With each increment thus added to the strength of the central idea there is a corresponding diminution of the strength of the undesirable ideas until finally the latter dwindle away and the central idea dominates the mind and bursts forth in action.²

The moment at which the ground is entirely clear and the desired eruption is ready to occur is the psychological moment. It is a time of great dramatic stress. For the central idea is in a state

² Kitson, *The Mind of the Buyer*, chap. XIII.

of the most delicate equilibrium, so slight that the merest trifle may disrupt it. Many a "perfectly good sale" has been lost, at least for the time being, through the inopportune occurrence of a telephone call, a baby's cry, an accident in the street.

How to meet this moment successfully is perhaps the most insistent question voiced by the salesman. In the light of the foregoing analysis the need is apparent for some stimulus that will release the neural energy generated by the central idea. As intimated above, a very slight stimulus may suffice. Some salesmen habitually reserve one good selling point and advance it at this stage, when the additional dynamogenetic force implicit in it gives the needed "push." Or they induce the purchaser to perform some minor physical act such as blowing the horn of the car, when the physical energy generated by the act flows to the brain over the afferent nerve pathways and furnishes the spark that sets off the act of assent. Sometimes a strong direct suggestion like, "Sign here," will accomplish the end. Sometimes a strong indirect suggestion, such as, "When will you have delivery?" will fit the circumstances more adequately.

6. Satisfaction.—

To the superficial observer and to the person who takes a narrow individualistic attitude toward selling, a sale is completed when the money has passed from the hand of the buyer to the palm of the seller. To one who regards the sale from a broadly social point of view, however, it is clear that the sale is not completed until the buyer is satisfied. The buyer does not cease thinking about his purchase immediately after he has made it. He carries along in his mental stream many relics of it: the original impression made by the goods; the manners of the salesman; the promptness of delivery. If he does not consciously ruminate about these facts and keep them in the center of his attention, he

at any rate carries them along in the margin of his thought-stream; and when he encounters a similar article he recalls his previous experience. If it was satisfactory he willingly makes a repeat purchase.

Again, the buyer carries about with him the visible evidence of the quality of the article every time he uses it. It gives him either pleasure or displeasure. If it wears well and fulfills all the claims made for it he feels satisfied and gives a repeat order.² Or he tells his friends. Thus the effects of one sale persist and spread in the minds of the consumers like waves made by a stone dropped into the water.

This conception of the sale as a continuous process has long been implicit in the teachings of business ethics; it has also been demonstrated to pay economically; it is now finally justified on psychological grounds.

METHODS OF INVESTIGATING EFFICIENCY OF ADVERTISING

The foregoing description of the mental processes involved in making a purchase furnishes only an outline for psychologizing about the consumer. The specific and detailed problems being attacked and those clamoring for solution are too numerous and varied to be listed here. The majority of those which have been thus far attacked by psychologists relate to the technical phases of advertising: the most favorable length of headlines; legibility of type-faces; value of various positions on the page, etc. Three types of such investigation may be prosecuted:

1. *Scientific Investigation of Returns.*
— Conditions may be arranged that the returns from one type of advertising may be compared with the returns from another type. By successive trials of different methods and by comparisons between the returns, the relative values of different advertisements may be determined.

² Kitson, *The Mind of the Buyer*, chap. XIV.

This scientific investigation of returns, however desirable it may be, is many times not feasible. The returns from many sales mediums such as billboards and cards are not measurable. Moreover, the components of a selling campaign are so numerous that it is difficult to isolate the several items and ascertain what part of the returns is due to each. Finally, the method is bound to be attended by some waste of effort and money. Altogether, despite its advantage of certainty of information, the method cannot be employed alone and in wholesale fashion.

2. *Laboratory Method.*—In the effort to avoid the wastes of the method just described and to determine beforehand what is likely to be the response to a particular advertising message, experiments are made in the psychological laboratory where conditions are arranged as nearly as possible like the conditions of the market; subjects are chosen typical of the prospective consumers; and measures are obtained of their reactions. This is the method most frequently described in the textbooks on the psychology of advertising. It has demonstrated its adaptability to the solution of a number of problems. With certain others, however, it is subject to limitations, chief among which are those imposed by the inevitably artificial atmosphere of the laboratory.

3. *Historical.*—There is still a third form in which the scientific method may be employed in the psychological study of advertising. The seller's aim, be it remembered, is to discover with scientific accuracy the effective way to do a thing before proceeding to do it. If the discovery cannot be completely made in the market or in the laboratory, recourse may be had to the scientific study of the experience of other sellers, which will give clues to profitable practices. As an example may be cited the investigations made by Starch and by the present writer showing the history of the use of borders with full-page ad-

vertisements. Results showed that the course during the past forty years had run as follows:

Year	Per Cent
1880.....	60
1890.....	61
1900.....	82
1910.....	77
1920.....	35

It is apparent that the use of borders increased until 1900, but that since that time the frequency has decreased until today it is only 35 per cent. On the assumptions of the historical method, that trends of practice show the pathways to profitable practice, the present-day advertiser will be in accord with other successful advertisers if he lays out his full-page advertisements without borders.

OTHER PROBLEMS SUGGESTED

Although advertising technique in the strict sense has claimed the greater part of the attention of psychologists interested in marketing problems, other phases of marketing offer equally profitable fields for exploitation. Questions of selling policy may be thus approached. For example, which is the best price for a commodity, \$1.00, 99 cents, 98 cents or 95 cents? Again, in devising a trademark that will be easily perceived, recalled, recognized and differentiated from others, one may profitably employ the laboratory method. To cite another example, if a firm desires to know what is its standing in the minds of consumers in a certain region, it may conduct an investigation similar to that reported by Hotchkiss and Franken, who asked one thousand consumers what particular brand arose first to their mind in connection with a list of staple commodities. Any firm conducting such an investigation in several sections of the country can discover in what sections

its prestige is weak and can strengthen its publicity accordingly.

There are two regrettable features in the present-day psychologizing about the consumer. One is the tendency to follow too much the methods of the earlier investigators in the field. While these methods were effective at the comparatively primitive stage of applied psychology they should be improved upon by new lines of research.

Another deplorable feature which is partly an outgrowth of the ingrowing tendency just mentioned, is the too-prevalent habit of conducting investigations on the consumer when he is not buying, and from the results inferring what he will do when he is buying. For example, in the effort to discover the strongest of several "motives," the question is asked a group of college students (whose representative character as the buying public is questionable), "Which of these ten appeals would be most likely to make you buy?" As a matter of fact, when the actual consumer of the product is engaged in making a purchase he may be affected by far different motives.

In short, the psychological investigations of the future should seek new paths of approach to the consumer, and in particular, should be made upon the consumer himself when and where he is consuming. The employment of professional psychologists in the marketing departments of several concerns is a happy trend in the right direction.

Space forbids a complete or even representative list of prominent and worthy psychological problems in the field that need to be examined. A truly enlightened program of research requires the intimate coöperation of expert marketer and scientist. As a greater number of business men become aware of the importance of the psychological factors, and of the possibilities of psychological technique;

and as an equally growing number of psychologists discover the needs and opportunities of business, there will come increasing skill in formulating problems and in solving them.

A sensible and well-balanced view, it goes without saying, must admit the statement made in a preceding paragraph, that the psychological approach, indispensable though it may be, must always be supplemented by the economic, sociological and ethical points of view.

Finally should be emphasized the necessity of abandoning the idea that psychology is an occult, clairvoyant method of "reading the mind" of the consumer. It must instead be thought of as a science, which eschews opinion and seeks only for fact. It has been addressing itself to marketing problems only a brief score of years (the first psychological study in advertising was reported in 1900 by Dr. Harlow Gale of the University of Minnesota). In consequence, a psychologist is exceedingly modest in claiming much accomplishment. He points instead to the future, and holds out the promise that with the exercise of patience, industriousness and coöperation on the part of all concerned, will come better and better understanding of the consumer.

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Research Methods in Advertising

By DANIEL STARCH

THE purpose of research in any phase of a business is to secure facts, develop methods, or establish principles which may be helpful in conducting that business—in brief, to eliminate waste and to bring about more economic management.

Waste in business is doubtless larger than most of us realize. It is probably larger in the field of distribution than in production. The chief sources of waste in advertising, which is closely allied with marketing, seem to be:

(a) Failure to coördinate advertising policies and work with the general policies of the concern and the activities of its operating departments;

(b) Use of advertising for commodities which, with an increasing volume of sales, do not yield a satisfactory profit;

(c) Failure to make all representations truthful;

(d) Use of ineffective advertising, that is, poor copy and bad presentation.

Nearly all of these sources of waste are due to the lack of adequate and reliable information on which to base decisions or to prepare plans. The development of methods of research in this field is therefore particularly important in reducing the element of guess and providing a more substantial basis on which to build plans.

Thoroughgoing research methods as applied to advertising and sales problems were virtually unknown until about ten years ago. During the past decade a considerable number of business concerns, and to some extent the

business departments of our colleges and universities, have made real beginnings in the application and development of practical and adequate methods of research. Many so-called researches or investigations are carried out without sufficient regard for the criteria of reliability or scientific caution. However, progress has been made in this respect.

DESK AND FIELD RESEARCH

Research methods in the field of advertising may conveniently be divided into two classes:

- (a) library or desk research;
- (b) consumer field research.

Library or desk research involves the use of available documentary material. Information is to be found in various Government documents, such as census reports, bulletins on commerce and labor, government income returns. If, for example, the problem were the preparation of an advertising program for the sale of an electrical appliance, reports on the distribution of electric power stations and the proportion of wired homes in various states and cities should be consulted. Such data are compiled by various electrical organizations. In other industries similar trade information is available.

There are numerous problems in the solution of which various facts about population are useful, such as the density and distribution of population by states, cities and rural districts, illiteracy, the distribution of publications, magazines and newspapers and the extent to which they are read.

Facts regarding income and the dis-

tribution of income are often highly important. Statistical data on the family budget in relation to incomes of various sizes provide another valuable source of information for many problems.

It is evident that such information, while relevant and useful, as a rule does not completely answer all the questions that must be raised. Therefore, one must use the second source of information or method of approach, through a direct first-hand investigation for the purpose of obtaining specifically the information which is wanted. This information may usually be obtained most directly and, if the inquiry is made properly, most reliably from the particular classes of persons who constitute the actual or potential consumers of the product under consideration, and to some extent from the persons who are engaged in the distribution of that product. Such a consumer field investigation may be conducted usually by means of a well-prepared set of questions. It is this type of research which has been most needed and which has been developed only within the last few years.

THE QUESTIONNAIRE METHOD

Much care must be taken in preparing the list of questions to be used in a consumer field inquiry. They must relate either directly or indirectly to the specific problems that require solution. So far as the questions themselves are concerned, they should, for the most part, be specific and definite so that a clean-cut response may be obtained. However, some questions of an indefinite nature should also be inserted so that the persons from whom responses are obtained may be entirely free to give an unimpaired response in their own language. Two or three such questions scattered through the list at the proper points will serve as a

useful check upon the information obtained in the more specific questions.

This point may be illustrated by the following two questions from a series used in an investigation of the mental attitudes and reactions of investors in buying securities.

A. What do you think is most important in putting money into any investment? (Put down exactly what the person says.)

B. Which of the following points do you consider most important? Number these in the order of importance 1, 2, 3, 4.

Rate of interest

Safety

Makes me save

Can turn it into cash at any time

The former gives the person answering the question entire freedom to express his individual reaction. The latter calls for specific relative comparison of the four points.

Leading questions which prejudice the answer have, of course, no place in a fair-minded inquiry. Moreover, the responses to a questionnaire will, on the whole, be most useful if they are obtained in such a way that they may be treated by proper statistical methods. This may usually be accomplished by formulating the questions properly at the outset.

Another point of importance in a questionnaire inquiry is the manner in which the responses are to be obtained. In general, there are two obvious methods, namely, by mail and by personal interview. There are advantages as well as disadvantages connected with both plans. The advantages of securing responses by mail are chiefly rapidity of securing returns and, to some extent, cheapness. The disadvantages are the brevity of the list of questions and the more or less selected nature of the replies. The list of questions sent out to be answered by mail

must necessarily be very brief in order to secure any considerable number of responses. Furthermore the persons who respond are by the very fact more or less selected. This is of no consequence in some types of investigation but it is of material consequence in many, if not most.

This selected character is likely to warp the results in ways which cannot be determined. Ordinarily, not more than 1 per cent to 10 per cent of the persons addressed respond. These persons may be more intelligent or more aggressive or more obliging or better to do than those who do not respond. Thus, for example, a questionnaire addressed to 5,000 owners of automobiles brought approximately 900 responses. In this list the proportion of owners of Ford automobiles was very much smaller than in the population at large. Such a factor tends to warp results.

PERSONAL INTERVIEWS

Responses secured by personal interview have these advantages: They may be very much more detailed; many more questions may be used; the persons to be interviewed may easily be chosen by a chance sampling method and the personal contact will bring many valuable reactions which cannot be secured otherwise.

If the interviewer is tactful, it is possible to secure answers to a large number of questions. Thus in an investigation of fountain pens and mechanical pencils approximately 50 questions were asked. The problem of the method of securing responses raises the question as to the number of returns that is needed to give an adequate cross-section of the situation. It is impossible to present here facts to determine how many responses are necessary to give a reliable index of a given type of consumers. However, from a

large variety of returns in a considerable number of investigations of this type, familiar to the writer, it is fair to infer that from 50 to 100 unselected samplings or individuals in a given community give an adequate cross-section for most problems of this sort. For a national investigation samples obtained from 5 to 10 communities in different parts of the country will ordinarily be sufficient. In other words, responses from 50 to 100 persons in each of 5 to 10 communities, or a total of 500 to 1,000 persons will ordinarily be enough to give a satisfactory national cross-section. This seems a small number, but the facts corroborate the statement.

Ten years ago questionnaire field investigations were almost unknown. Today they are carried out in connection with many of the important national programs of advertising. Criticism is now and then directed against such inquiries. Many of these criticisms are deserved because unfair and unscientific procedures are often followed. The greatest care and regard for fairness and open-mindedness must be maintained. When these conditions are thoroughly complied with, the questionnaire field method has proved itself to be highly useful. It is furnishing a source of information and a means of obtaining the data and reactions of the consumer who is to be reached, which cannot be obtained in any other way. The average advertising or business executive is usually so close to his business that it is impossible for him to take the point of view of the average consumer, and even if he were able to do so he would still represent the reaction and attitude of only one individual. It is important to have the attitude and response of a sufficiently large number of individuals to indicate the actual situation.

TESTING ADVERTISEMENTS

There is one other method of research which comes under the consumer field method. I have designated this as the *laboratory field method of testing advertisements*. The results of the questionnaire method serve to point out the manner in which an advertising program is to be planned, but it does not indicate specifically how the individual advertisements are to be prepared. There are many different ways in which a given point may be presented. Let us assume that in the case of a food product the factor of taste or the appeal of nutritive value is to be presented, or suppose that a questionnaire investigation reveals the fact that safety of an investment is the most important consideration in the minds of investors. The problem still remains as to how the taste or nutritive value of a food or the safety of an investment may be presented most effectively in an advertisement. There are scores of ways in which it may be done.

The next step, therefore, in applying research methods to the development of a complete advertising program is to prepare a variety of different possible ways of presenting an appeal, either by illustration, or by text, or both. In other words, a variety of experimental advertisements should be completely prepared in proof form. These proofs should then be tested by a laboratory field method described in a recent book by the writer.¹

The methods referred to are designed to obtain a relative measure of the effectiveness of each of the important elements of an advertisement. These important elements are ordinarily considered to be five, namely: to secure attention, to develop interest, to convince, to produce action and to leave a

permanent impression on the memory.² Methods have been developed whereby it is possible to test or measure the relative effectiveness of various ways of stimulating each of these five responses. It is possible, for example, to take a group of experimental advertisements and determine, by means of a series of tests with between 25 and 50 persons who are typical of the class to whom the product is to be advertised, which of these advertisements most successfully secure the attention of the reader.

In the same manner it is possible to measure the relative interest value of the various experimental advertisements. Moreover, their relative power to convince the memory or action value can be measured and determined.

Such tests carried out with 25 to 50 individuals for each of these elements will give a very satisfactory measure of the relative value and effectiveness of the advertisement with respect to each of these elements and as a whole.

The cost of such an investigation is negligible compared to the expenditure for space in which the advertisements are to be used. It is not uncommon in a national advertising campaign to insert the identical advertisement in space costing \$100,000 or more in the various publications used. It is obvious, therefore, that every element and detail in such an advertisement should be as effective as it is possible to predetermine it.

The objection will naturally be raised with regard to such testing methods that it is impossible to determine in this manner just how an advertisement is likely to appeal to the public. It will suffice to say here that tests of this type applied by the writer to a large variety of advertisements which had been used in national advertising campaigns—

¹ Starch, D. "Principles of Advertising," 1923. A. W. Shaw Company.

² Compare with statement in article entitled "Psychology in Salesmanship."—Editors.

for which definite measures of the returns brought by these advertisements were available—show that the actual returns obtained by the advertisements checked up closely with the results of the tests.³

We have thus outlined two general methods of research, (1) the library desk research and (2) the consumer field method. The latter involves (a) the questionnaire inquiry and (b) the laboratory field tests of advertisements.

DESIRABILITY OF RESEARCH

The gradual development and the more general application of thoroughgoing, open-minded methods of investigation will, no doubt, materially aid in the elimination of waste and in the more effective carrying out of plans. Eight or ten years ago a questionnaire field investigation as the preliminary groundwork for advertising plans was regarded as a novelty. Today such investigations are recognized as fundamentally important and are usually made in connection with important advertising projects. However, a questionnaire field investigation, while important, furnishes only a part of the facts on which advertising plans are based. It is not sufficient merely to make such an investigation. Equally necessary is it to test the advertisements based upon the questionnaire investigation. Such investigation may show that taste or nutritive value is the strongest appeal for milk, or that style or wearing quality is the strongest point for shoes, but it will not show what the most effective presentation of the appeal may be. It will not show whether by picture or text or by what kind of picture or by what kind of

phraseology the point may be presented most effectively.

This statement is fully borne out by several cases in which extensive questionnaire field investigations were made, the results of which showed certain points to be plainly the outstanding features that should be emphasized in the sales appeals. Several copywriters and artists prepared advertisements which represented their best efforts to present these points. When these proposed advertisements were tested in proof form, they showed surprisingly large differences in effectiveness. A weak selling point presented in an effective manner will actually be more influential than a strong selling point presented poorly. By means of properly conducted tests, it is possible to arrive more closely at a correct answer to many of the numerous questions that arise; it is possible to determine which are the strongest appeals and which are the most effective presentations of these appeals.

The careful testing of the copy, text, illustration, layout, and other elements, which have been prepared on the basis of a questionnaire field investigation, is a further important step in determining as fully as possible in advance the probable effectiveness of the proposed advertising plans. Thus, scientific testing methods, applied to the problems of advertising, promise to open a field of possibilities and to make advertising more effective and put it on a more economical level.

In view of the possibility and reliability of these methods, no important advertising plan should be carried out without first making an adequate consumer questionnaire investigation followed by a thorough series of tests of the proposed advertisements themselves and the essential elements in them.

³ See "Principles of Advertising," by the writer of this article, chapters 13 to 15. A full discussion of the questionnaire method may be found in chapters 7 to 10.

Psychology in Salesmanship

By JOHN ALFORD STEVENSON

PSYCHOLOGY is usually defined as the science of human behavior or conduct. Salesmanship is, therefore, a problem for the field of psychology since its object is to induce people to act in certain desired ways. Human activity that relates to salesmanship is as much subject to psychological laws and principles as is any other phase of human activity, and salesmen are coming more and more to recognize and profit by this fact. The old idea was that there were no underlying principles in salesmanship. Here seemed to be a group of facts that the psychologist could not explain. One salesman would use a particular sales argument with great success. Another salesman would adopt the same procedure only to meet with failure. A statement that would arouse interest and desire on the part of one prospect would leave another cold and unaffected. Where was any science to all this? What laws or principles were involved when every case had to be treated differently? Such was the reasoning of salesmen of the old school.

But when the psychologist set to work on the problem he found that psychological laws hold just as true in the field of salesmanship as in any other field of human activity. The so-called "natural-born" salesman is successful because more or less unconsciously he works in harmony with psychological laws.

What are the psychological principles which govern successful salesmanship? In proceeding to a detailed answer to this question we must keep in mind that all human behavior is a continuous interplay of stimulus and response.

What the response in any given situation shall be depends both on the stimulus and the responding individual. Thus the sight of food when an individual is hungry will ordinarily call forth the response of eating. But just after a full meal, the same stimulus will produce no such response.

The same stimulus may call forth any one of a variety of responses. Watson in his *Psychology from the Standpoint of a Behaviorist* (p. 298) states in this connection:

In adult life each single object or situation can call out more than one response. The sight of a dog can cause me to run and climb a tree or to whistle for it to come and be petted. Likewise, the sight of this animal may lead me to go and get food for it, or to muzzle it, or to get my gun and go shooting. The more highly educated the man the larger the number of responses any object can call out. When explicit and implicit vocal responses are considered we can gather some idea of the enormous number of reactions that center around each situation or object. It is this possibility of multiple response to a single stimulus that makes man's reactions hard to predict in a particular instance.

In discussing the determiners of acts Watson proceeds further to say:

The most important determiner, of course, is the life history of the individual in the sense that his general and special training, illnesses, disappointments, hobbies, family training and the like develop within him definite attitudes, trends, or slants.

The process of making a sale consists of a whole series of stimuli and responses. The response to one situation becomes in turn the stimulus to a new response.

Mere sight of the salesman may cause the prospect to respond with, "What can I do for you?" or some similar question. The prospect's question calls forth a certain response from the salesman. How the prospect will respond in turn, depends quite as much on his condition at the time as upon what the salesman says. If, for example, the prospect has just finished a very tiring interview, or has an important appointment approaching, the response will quite likely be different from what it would be if he felt at leisure and had just received some especially good news.

In considering the sales interview as a whole series of stimulus-response activities, it is important to recognize that the stimulus is far more than mere spoken words at any particular time. It is the entire situation affecting the prospect. This includes the salesman's appearance, his tone of voice, his facial expression, the possible presence of a third party at the interview and many other factors. The presence of a third party at an interview often creates a situation which makes favorable responses less likely than when the prospect is alone. Successful salesmen usually try to avoid interviewing under such circumstances. It is also generally recognized among successful salesmen that it is not so much *what* is said, but *how* it is said, which works for or against the chances of a sale.

"I'm not interested in your proposal at all," was a response encountered by a salesman at the beginning of an interview.

"How do you know you're not interested?" asked the salesman; "I haven't really had a chance to explain what it is."

A certain type of salesman could make such a reply to a certain type of prospect and get a favorable response. On the other hand, if tried under different conditions it might irritate the

prospect sufficiently to cause him to terminate the interview.

If the salesman could know the sum total of conditions, past and present, that are influencing the prospect at a particular time the making of sales would be much simplified. It is obvious that the more the salesman knows about the prospect the more effectively can he control the chain of stimulus-response situations in such a way as to elicit the final response of the prospect's order. The successful salesman, therefore, gives the prospect a chance to talk and gets him thereby to reveal the conditions that are influencing him. By asking questions he tries to get responses from the prospect which will serve as guide-posts showing whether the chain of stimuli and responses is leading toward the desired goal.

It is on account of these facts that objections are frequently helpful rather than harmful in making the sale. They show which way the wind is blowing and enable the salesman to guide the interview accordingly. The hardest kind of prospect to deal with is the one who will not talk, who does not attempt to take issue with anything the salesman says and is simply "not interested." Some of the psychological principles involved in meeting objections successfully will be discussed in a later paragraph.

PREDICTING HUMAN BEHAVIOR

The psychological principles of greatest interest to the salesman are naturally those which govern the arousing of a desire on the part of the prospect for what the salesman has to offer. The success of a salesman depends very largely on his ability to predict human behavior. He must know in advance something of the type of response that a particular statement will call forth.

As has been previously pointed out, the whole situation affecting the individual at the moment must be considered as the stimulus, and the response depends quite as much on the condition of the individual at the moment as upon the stimulus. At first thought, then, it would seem to be an almost hopeless task to predict how the prospect will respond to any statement a salesman may make. Although we probably shall never be able to predict with absolute certainty just how a given individual will respond in a particular set of circumstances, we can frequently predict the general type of response. We know, for example, the general way in which most people will respond to a joke or funny story, how they will respond to particularly good news or to an insulting remark. In other words, people have certain natural ways of acting. They do not reason out the situation and deliberately decide what their action shall be. The response is spontaneous, unpremeditated. In the frequently quoted words of William James:

The cat runs after the mouse, runs or shows fight before the dog, avoids falling from walls and trees, shuns fire and water, etc., not because he has any notion of either life or death or of self-preservation. . . . He acts in each case separately and simply because he cannot help it, being so framed that when that particular running thing called a mouse appears in his field of vision he must pursue; and when that particular barking and obstreperous thing called a dog appears he must retire if at a distance and scratch if close by; that he *must* withdraw his feet from water and his face from flame.

Activities of this type which are not learned but are the result of inherited tendencies are termed instincts. An instinctive reaction is almost as sure and automatic as the ringing of a doorbell when you press the button. The

nervous system is apparently "all set" for the particular response.

The surest way, then, in which the salesman can be certain in advance as to the type of response the prospect will make is to appeal to these instinctive tendencies. The more closely the appeal is related to such instinctive activities the more certain and immediate will be the response. As the stimulus becomes further removed from such instinctive tendencies, the intellectual faculties of reasoning and deliberation are brought into play. The nature of the response then becomes more uncertain and less immediate.

Suppose, for instance, a baker should fill his window with pictures of the building in which his products were baked showing absolutely sanitary conditions. Suppose he should show testimonials and statements by health experts indicating the high quality of his products. In the course of time he might build up a good volume of trade. But if a baker on the next block should display in his window attractive cakes and pastry, he would probably build up a list of customers far more quickly. The direct appeal to the desire to eat delicious food through actually presenting the food to view is more effective than less direct appeals involving the use of reasoning.

Psychologists seem to differ in varying degrees in the classification of instincts. Two types of activity may be regarded by one psychologist as distinct instincts while others regard them only as different manifestations of the same instinct. Regardless of such differences of opinion we may mention certain types of response which clearly have an instinctive basis, and show how the salesman may make use of such instinctive acts. A complete catalogue of instinctive activities which

the salesman may make use of is not within the scope of this article.

The importance of the hunger motive in human life is readily apparent. The satisfaction of this motive plays a large part in making men and women perform day after day tasks which may be very disagreeable. Appeals to this motive are therefore likely to meet with quick response.

A salesman who is selling cooking utensils is more likely to get a favorable response if he talks about the delicious appearance of the food that can be cooked in the utensils because of the particular way in which they are made, rather than if he dwells on such points as the attractive appearance of the utensils and their durability. To be sure the salesman would be likely to use these other appeals but if he neglects to picture the tempting, tasty food which the use of his product makes possible, he is overlooking a powerful action-producing appeal.

We are all familiar with street-car and magazine advertisements of food products, which present the article so attractively as actually to make the "mouth water."

We all have a natural tendency to touch or handle objects that come within reach. This is well illustrated in children who are certain to get hold of any new object that comes into the house. Curiosity is probably a phase of the manipulative instinct. If we see a microscope we have an impulse to try to look at objects through it. All of us have probably felt the desire to touch a painted surface which has been marked "wet paint."

In many kinds of selling this instinctive tendency to handle objects is used to great advantage. The salesman who is selling brushes is creating a sales-assisting situation when he gets the prospect to feel the fine quality of the bristles in his brushes. Likewise,

the salesman for a vacuum-cleaner is certain to make the prospect more favorably disposed if he can get her to operate the machine.

There are a group of instinctive activities which are indicated by such terms as "self-assertion" or "rivalry." These may take the form of display or a tendency to "show off" in the presence of others, or a tendency to assume leadership. We are all familiar with the machine in the amusement parks for testing one's strength by measuring the force of a blow delivered by a large wooden hammer. The success of this and innumerable other amusement park devices, such as dart-throwing, rifle-shooting and the like, depends partly on the operation of instincts belonging to this general group. The saleslady for millinery is appealing to such instincts when she speaks of the exclusiveness of the model she is showing and of how well it becomes the prospect. Likewise, the salesman for high-priced automobiles is using a powerful sales appeal when he gets the prospect to picture himself as the possessor of something his friends and neighbors do not have.

Another form of sales appeal based on the rivalry instinct is brought into play when the salesman makes such remarks as, "Mrs. Jones, next door, has ordered this complete set," or "Mr. Brown is using this machine in his business."

Although the evidence is rather indefinite, there seems to be some indication of an instinctive tendency to submissiveness or to "follow the leader." There is probably some instinctive basis of this kind which accounts for the intense loyalty of people to men like Wilson or Roosevelt. It probably has something to do with the great power and influence of the political "boss" or "ward-heeler." We see it illustrated in the way in which people

take up fads or fashions adopted by the leading screen actors and actresses. We are all familiar with the advertisements which say that Marion Davies or Mary Pickford uses this or that face powder or beauty cream. Life insurance salesmen make use of statements by the President and members of his Cabinet endorsing the value of life insurance.

Whatever the exact nature of this instinctive tendency to follow those we regard as leaders, it unquestionably furnishes the basis for many effective sales appeals. The statement that "Adams & Company, Black & Son, and in fact, nearly all the leading grocers in the city are carrying this brand of goods," is likely to have considerable effect in causing a grocer to "fall in line."

Closely related to the instinct of following a leader are those acts which we call "imitation." Whether this is a distinct instinct, or is just a different manifestation of the instinctive tendency of following the leader, makes little difference so far as the salesman is concerned. The same types of sales appeals are called for in both cases.

An instinctive tendency which probably operates as an aid to many sales is that of acquisitiveness. People like to acquire objects simply for the pleasure they get out of ownership. We see this illustrated in the tendency of a small boy to collect marbles, or in the tendencies of older people to collect stamps, works of art, books and the like. Mere desire to possess may sometimes lead to a purchase, but a direct sales appeal to such a motive is difficult and is not likely to be as effective in producing action as other methods of motivation.

In some kinds of selling, the appeal to the sex instinct or to the parental instinct is the strongest appeal that can be made. Often a man's love for his wife or children will lead him to act

when no other appeal could make him buy. Although appeals to various instinctive tendencies can be made in selling life insurance, most life insurance is undoubtedly sold because of the love of a man for his wife. The automobile salesman who makes some such remark as, "Think how much pleasure your wife and children will get out of this car—how much it will mean to them to be able to get out in the fresh air this way," is using an appeal that has high action producing value. It is reported that the sales of an electric washer were greatly increased when the appeal was changed from an appeal to the woman to save time and labor to an appeal to the man to prevent his wife's becoming a household drudge.

The instincts to which reference has been made represent by no means a complete classification of instinctive activities. They have been chosen as typical of instinctive action in general and the important bearing it has on the problems of salesmanship.

Although all human action is probably based on certain original or instinctive tendencies, these become so much modified by and interwoven with acquired or habit activities that any attempt to separate the two is extremely difficult. For example, we all have an instinctive tendency to play or engage in sport. But particular forms of sport such as tennis, or golf or baseball, are the outcome of habits grafted on to the inherited tendency. Every instinctive activity is probably linked up with a variety of habits through which it expresses itself. We have acquired the habits of using cooking utensils, tables, knives, forks, spoons and the like in connection with satisfying the instinct of eating.

Success in salesmanship depends directly upon how closely the salesman, either consciously or unconsciously,

relates his appeal to the instinctive and habit activities of his prospect. Instinct through its habit modifications furnishes the basis for the response which the salesman seeks to call forth.

STEPS IN THE SELLING PROCESS

Although man's original and acquired tendencies furnish the groundwork upon which the structure of successful sales appeals must be built, there are many details in the building of this structure where a knowledge of psychological principles is of great value to the salesman. Most books on salesmanship divide the selling process into these steps:

1. Securing attention.
2. Arousing interest.
3. Creating desire.
4. Establishing conviction or confidence.
5. Forcing decision and action.

While such a division is helpful for purposes of analysis, it should be kept in mind that probably in no sale are these different steps clearly marked off. Attention can be held only very momentarily without the arousal of interest, and interest is always effective in securing attention. Frequently in selling, desire may exist from the very beginning. A prospect for life insurance may, for example, desire the insurance without any sales argument whatsoever, but his desire may not be sufficient to cause him to take the necessary steps to secure it.

In regard to the securing of attention Woodworth (*Psychology*, p. 248) says:

Three general factors of advantage determine the power of any stimulus to attract attention. There is the native factor consisting of change, intensity, striking quality and definite form; there is the factor of habit dependent on past experience; and there is the factor of present interest and desire.

The first of these factors is embodied in the mere approach and opening remarks of the salesman. This calls forth a certain form of what we may call involuntary attention. It is important that the attention be directed to what the salesman has to say rather than to extraneous factors about the salesman which may serve as distractors. For example, the prospect's attention will very likely center on the salesman's appearance rather than on what he is saying, if the salesman happens to be either flashily or shabbily dressed. Chances of a successful sale are therefore increased if the salesman sees to it, so far as possible, that his appearance will not attract attention to himself, or in other words act as a distractor. The salesman is also far more likely to bring the prospect's attention to focus on what he is saying if he assumes an attitude of self-confidence rather than if he is self-conscious and lacking in assurance.

In the securing of favorable attention the factors of habit and interest, to which Woodworth calls attention, are particularly important. Nearly every prospect has probably developed certain thought habits by which he attempts to avoid a sales interview. These may take the form of such remarks as, "I am very busy," "I have no need for your machine," "I am all stocked up." For the salesman to attempt to answer such statements merely serves to call the prospect's attention to them all the more forcibly. The successful salesman, therefore, usually passes over such remarks and attempts to get attention through the arousal of interest. Of course the prospect may really be very busy or be thoroughly convinced that he has no need for what the salesman has to sell, but usually such statements are habit reactions.

Psychological principles governing

attention operate decidedly to the salesman's disadvantage if he mispronounces the prospect's name or calls him by a wrong name. Few things give a man a sense of being of little importance more than being called by a wrong or mispronounced name. The salesman who makes such an error is quite likely to find that the prospect's attention is not directed to further remarks the salesman may make.

The presence of a third party at an interview operates as a strong distractor of attention. Not only may such a situation divert the attention of the prospect, but it may divert the salesman's attention to such an extent as to cause him to overlook important points. An interview under such conditions is, therefore, usually avoided by the successful salesman by some such remark as: "Oh, I didn't know you were busy. When would you be able to see me?"

As Woodworth points out, attention is also attracted by interest or desire. A set of golf sticks displayed in a window will invariably attract the attention of a man who is just learning the game, to the exclusion of dozens of other articles on display.

PSYCHOLOGY OF INTEREST IN SALESMANSHIP

Attention without interest is very momentary and unless the salesman almost immediately arouses interest the attention secured avails him little. Interests and desires arise out of the fundamental bases of human activity—the instincts. To a young man in love the subject of his sweetheart is extremely interesting. The father is invariably interested in anything pertaining to his son.

E. K. Strong, Jr., says in this connection (*Psychology of Selling Life Insurance*, p. 101):

Situations arousing instinctive responses are always interesting, barring unusual accompanying circumstances. Consider the fighting instinct. All men enjoy fighting. A fight between boys, between dogs or between roosters will attract a crowd. And the crowd is thrilled. It is estimated that \$1,000,000 was spent by the men who attended the Willard-Dempsey fight at Toledo.

Objects not in themselves interesting may become interesting through association. Thus the father is very likely to become interested in the college attended by his son.

William James, in one of his *Talks on Psychology and Life's Ideals*, makes this statement:

The most natively interesting object to a man is his own personal self and its fortunes. We accordingly see that the moment a thing becomes connected with the fortunes of the self, it forthwith becomes an interesting thing. What more deadly uninteresting object can there be than a railroad time-table? Yet where can you find a more interesting object if you are going on a journey, and by its means can find your train? At such times a time-table will absorb a man's entire attention, its interest being borrowed solely from its relation to his personal life.

If the salesman talks in terms of the prospect's interests he is quite certain to arouse interest in what he has to say and the matter of securing attention is taken care of automatically. Anything that concerns the prospect himself and his affairs is certain to be interesting. But he is very likely not to be interested in the salesman, the company he represents or the commodity or service he is selling. As frequently expressed in the literature of salesmanship the salesman should take a "you attitude." An opening statement in an "I attitude," that is, in terms of the salesman, his company and his product is illustrated by the following:

"Mr. Adams, my name is Hopkins. I represent the Eureka Life Insurance Company. My company has just gotten out a new policy which is a combination of an ordinary life policy and an endowment. It has the double indemnity and disability benefits and cannot be surpassed by the policies of any other company. I can explain the features of this policy to you in about ten minutes."

Contrast the attention and interest value of the statement above with the following statement in the "you attitude":

"Mr. Adams, my name is Hopkins of the Eureka Life Insurance Company. You seem to have a fine business here and are probably enjoying a good income. Would it be possible for Mrs. Adams to continue the business in the event of your death? Or will you continue to draw an income after you have retired on account of old age? Perhaps you haven't realized that for a very small outlay you can insure against loss that which is worth more than all the property you may own. I refer to your earning capacity."

In order to talk in terms of the prospect's affairs and interests, the successful salesman secures as much advance information as possible. He supplements this by observation on entering the prospect's office. A bag of golf sticks in the corner, a piece of antique furniture, a picture on the wall, any of these may furnish the cue to an introductory remark that will call forth the prospect's attention and interest.

CREATING DESIRE FOR THE SALESMAN'S PRODUCT

Desire arises from the consciousness of an unfulfilled need. It is the consciousness of a satisfaction we might have but are not now enjoying. Here again the instinctive bases of human

action play a fundamental part. Man gets satisfaction when he acts in accordance with his instinctive tendencies. The thwarting of such an instinctive tendency creates the mental state which we term desire. In a small boy the instinctive tendency to fight is called forth as result of provocation by another boy. But the realization of punishment awaiting him at home if he fights may thwart the instinctive act. In such a case the boy is likely to be conscious of a very strong urge or desire to fight. This desire for the satisfaction which will result from fighting may become so strong that it quite offsets the fear of punishment, and the boy will then fight.

When the salesman relates his products to the prospect's instinctive activities such as have been discussed in earlier paragraphs, he not only arouses interest but he creates a want or desire for the satisfaction which will come through acting in the way the salesman suggests, namely, signing the order.

Emotion plays an important part in creating desire. Emotions like instincts are a part of man's "native equipment." It is quite evident that fear, anger, gratitude, joy, sorrow and the other emotions are not acquired through learning. They are in the nature of an automatic response to some external stimulus. We naturally feel gratitude toward one who does us a kindness, and a slurring or caustic remark automatically arouses the emotion of anger. Emotion frequently creates the "set" for an instinctive response. If a boy is angry, provocation by another boy is much more likely to lead to a fight than if the boy were not already angry when provoked.

The emotions aroused by the old-time evangelist in painting the horrors of a hell for lost souls and the joys of

heaven for the saved, served as a powerful aid in bringing about the desired response of seeking salvation.

While it is much easier to get action from a person in an emotional state than from one not so stirred up, the use of the emotional appeal in salesmanship must be handled very skillfully to secure the desired action. Emotions have a tendency to associate themselves with objects in the surrounding environment. The boy who hates going to school is apt to hate the teacher and everything connected with school. We like a place in which we have had some unusually pleasant experience and dislike a place where the reverse is true. The life insurance salesman who stirs up emotion by painting a black picture of the prospect's destitute widow and children is taking a chance that the aroused emotion will attach itself to the policy he is trying to sell, or to the salesman himself with disastrous results so far as a sale is concerned.

Because of such a condition it is usually safer to arouse a pleasant rather than an unpleasant emotion. Instead of picturing the landlord putting the widow and children out on the street to find their way to the poorhouse, it is better to picture the home kept intact and the children growing up under their mother's care.

Emotional appeals can best be made use of through human interest stories, and such appeals usually produce a readiness for action more effectively than the most logical discourse. The evangelist who would substitute for emotional appeals, a logical series of reasons tending to show that the proper thing to do was to seek salvation, would probably make few converts.

It is not to be assumed that emotional appeals will always produce favorable results. Too much sentiment or emotional appeal in the sales

talk, like a movie with too much "sob-stuff," excites a feeling of scorn.

SALES APPEALS THROUGH USE OF SUGGESTION

Frequently sales appeals are not intended to cause any particular emotional incitement. The attempt is made to stir up through suggestion some impulse which may or may not have an appreciable emotional accompaniment. It is rarely that we reason out a particular cause of action. We usually act on impulse. The object of suggestion is simply to call an impulse into operation. A particular brand of coffee is advertised as "good to the last drop." Such a statement makes no particular emotional appeal. It presents no logical reason why that particular coffee should be bought in preference to any other. But the mere suggestion that it is good coffee arouses an impulse to taste it.

A suggestion in salesmanship may be regarded as an indirect appeal to the feelings and instincts, in which the emotional incitement is relatively slight. A suggestion puts an idea in the prospect's mind which tends toward the action the salesman desires to call forth. This is repeatedly illustrated in retail selling. Suppose, for example, a man goes to a store to buy a shirt, and after the purchase is completed the salesman makes some such statement as, "Wouldn't you like to see our fine new assortment of ties? We have a full line of the newest styles and most attractive patterns." A suggestion of this kind immediately calls forth an impulse to see the ties and very frequently an additional sale results.

The action-producing value of suggestions depends on a number of factors. Suggesting an opposing idea may nullify the value of the original suggestion. The mention of a com-

peting product or company is likely to impede the prospect's decision by inviting comparison. An impulse to investigate the competing product is aroused.

Among other things the action-producing value of a suggestion depends on its force. If a friend says to us, "Go to see such-and-such a show before it leaves town; it's the most wonderful play, I think, I have ever seen," we impulsively decide to see the show mentioned. Compare the force of the suggestion above with one like this: "You ought to see such-and-such a show some time. I enjoyed it very much." This does not mean that the salesman must exaggerate. He should, however, show enthusiasm and speak with conviction.

The suggested idea will be more powerful if the prospect considers it his own. Nearly every person is somewhat predisposed to favor his own ideas. This is probably a manifestation of the self-assertive instinct. A suggestion such as, "Mr. Jones, you're a man of quick action, so you'll probably want to do this right away," is considerably more likely to produce the desired result than such a statement as, "I'd advise you to do this right away."

Positive suggestions are more effective than negative ones. To tell a small child not to do a particular thing puts the idea of doing it in the child's mind, and the particular forbidden act is very likely to be done. The salesman who says to a prospect, "Don't put off your decision," is very likely arousing an impulse to do just that thing.

The action power of a suggestion depends on the prestige of its source. The more we admire a person or his accomplishments the more weight do we give to anything he may say. This means that the salesman should try

to establish his own prestige on as high a plane as possible. A tendency to exaggerated statement or a display of ignorance of features about the product being sold will lower prestige and so lessen the chances of a sale. Frequently, the salesman borrows from the prestige of others, as, for example, when he quotes the opinions of people whom the prospect admires.

SALES APPEALS TO THE INTELLECT

The arousal of desire or impulse to act through emotional appeals and suggestions alone does not go far enough in most lines of selling. Although we tend to act on impulse, we also try to find reasons to justify our acts. The salesman, then, must supply the prospect with reasons which justify his acting in accordance with his impulses, or desires. It is this step in the selling process which is frequently designated as "establishing conviction." The sales appeal here is to the intellect or reason. It involves the enumeration of the particular selling points, advantages and superiorities of a particular product.

The extent to which the logical type of appeal must be used depends on the type of commodity being sold, the type of prospect, and to some extent the amount involved. A salesman for locomotives must naturally place more emphasis on "reasons why" and less on impulses arising from instinctive tendencies than the salesman for automobiles. Similarly, a prospect might part with a small sum of money purely on impulse and without rationalization when he would not do so in the case of a considerable financial outlay. Certain types of prospects act somewhat readily on impulse, while others must first have the "hard, cold facts."

IMPULSES COUNTER TO THE SALES APPEAL

How a person will act in a given situation usually depends on the final harmonization of a number of conflicting impulses. Angell in his *Psychology* (p. 430) says:

The statement is often made that the development of volition is neither more nor less than a process of reducing our impulses to order, and that a mature character is simply one in which the impulses are thus subordinated to some systematized principles.

Throughout the process of making a sale the prospect is likely to have a great many recurrences of the impulse to buy. His desire to get rid of the salesman may arouse such an impulse; every telling sales appeal probably excites such an impulse, if the prospect's interest has been aroused. The reason why he does not act on these impulses is because other conflicting impulses prevent it. The thought of what his wife may say may arouse an impulse not to buy. Similarly the thought of what he had planned to do with the money required for this purchase, or the thought that he may get the article cheaper somewhere else, or a dislike of the salesman may give rise to conflicting impulses. These conflicting impulses are usually expressed in the form of objections.

Objections to purchase may vary all the way from what may amount practically to a prohibitive reason, such as lack of money, to a mere rationalization of the prospect's action in refusing to buy, and the salesman's treatment of the objection should vary accordingly. Frequently in attempting to rationalize his decision not to buy, the prospect will make statements which are really excuses and which he does not expect to have answered. Such excuses may be forgotten almost im-

mediately if the salesman does not fasten the prospect's attention on them by attempting an answer. They may be simply "passed up"; sometimes, however, the prospect may make some defensive statement which is untrue and which would be damaging to the salesman to allow to stand unanswered. Such statements can best be answered by a simple statement, such as, "I'm sure there must be some mistake; my company does not tolerate any such practice as that."

The best answer to an objection is to turn it into a reason for buying. The impulse which previously tended to negative the buying impulse can thus be made to augment it. If the prospect says, for example, "I can't afford it," that is a very good reason why he should buy because the article under discussion will pay for itself and make money for him besides.

Sometimes it is best to agree with the prospect up to a certain point, but to destroy the force of the objection by an additional statement. To a prospect, for example, who says, "Yours is the highest priced machine on the market," the salesman might reply, "Yes, it is. But there's a reason. Five years from now the difference in price won't make any difference, but the difference in quality will."

In handling any type of objection it is particularly important that the salesman avoid argument or showing any irritation. To do so will fix the objection all the more strongly in the prospect's mind and lead him to believe he has found the vulnerable point in the salesman's armor.

Objections are very frequently a help rather than a hindrance in making the sales. They reveal to the salesman the nature of the conflicting impulses in the prospect's mind which must be overcome before he can act on the

impulse to buy. The prospect may have a strong desire to buy and express conflicting ideas simply to get the salesman's help in harmonizing the conflict. In answering the objection the salesman must either nullify the conflicting idea, as he does when he turns it into a reason for buying, or else through additional suggestions increase the strength of the impulse to buy. On this account the successful salesman usually finds it very desirable to hold some selling points in reserve, to strengthen the buying impulse at this particular time.

CLOSING THE SALE

There is a great deal in the literature of salesmanship about the "psychological moment" for closing. Many salesmen are obsessed with almost a fear of missing this critical moment which is supposed to determine whether the sale is to be made or lost. An analysis of the psychological principles of salesmanship along the line developed in the preceding paragraphs indicates that such a theory is fallacious. There may be a dozen psychological moments for closing during the course of a sales interview. Once desire has been aroused the impulse to buy is continually surging back and forth. After some particularly good sales suggestions or emotional appeal the urge to buy is strong. Then some idea comes to mind which sets up a counter impulse, which in turn is dissipated by some statement of the salesman.

There may be many times during the sales interview when the impulse to buy is so strong that with the slightest aid by the salesman it would be translated into the desired action. It is, therefore, safe to make a number of try-out closes during the interview.

There is no harm in giving the impulse to buy a chance to express itself at any time when it seems to be in an ascendant wave. If such trials show that the prospect is still unwilling to close, the salesman can immediately swing back into the sales talk.

The successful salesman removes as many of the obstacles as possible which are in the way of the expression of the buying impulse. One method is to get the prospect in a "yes" attitude by frequently asking questions which obviously call for a "yes" answer. Another device for making the expression of the buying impulse easier is to get a decision on minor points, or between two alternative proposals by some such question as, "Do you want this delivered at your office or at home?" or "Do you wish to have these goods shipped by parcel post or by express?"

The conflict of opposing impulses as a result of the sales talk puts the prospect in a stirred mental state. He seeks the satisfaction which a settlement of the conflict may bring. This urge for escape or relaxation from the strain of conflict may sometimes lead the prospect to buy when it is clearly contrary to his own best interests. A consideration of this point leads, of course, into the field of ethics in salesmanship. But regardless of the ethical principles involved, it is psychologically bad for the salesman thus to exploit the prospect, if he is to continue to do business in the same community or ever expects to sell again to the same prospect. The salesman who follows psychological laws in forcing sales under these conditions is at the same time following psychological laws which will destroy prestige and create ill-will toward himself and the company he represents.

The Psychology of Saving

By E. H. CAMERON

THE most distinctive mental asset of man as compared with the lower animals is foresight, the capacity to act in the present as if the future were also present. The fundamental basis for such action is the power of representative thought, that is, of imagination. But imagination which issues in care for the future is never mere fanciful imagination untrammelled by reality. It is a looking ahead in the light of past experience. Imaginative insight into the needs of the future is a tree the growth of which is dependent on roots striking down into the past.

But to act in the present as if the nonexistent future were more real and important is in some sense to ignore the present, which is so insistent in its demands for immediate action. Foresight implies deferred action, deliberation, inhibition of immediate desires, labor and sacrifice. Thus, if man has risen superior to the lower animals, it is at the expense of being burdened by a certain duality of nature by virtue of which he has to choose between the satisfaction of present desires and future needs. The history of mankind in his struggle for civilization is a record of a slow and laborious improvement marked by a steadily increasing use of foresight.

THE ACQUISITIVE "INSTINCT"

It has been held, and with some justification, that the desire for the collecting and ownership of objects is a definitely instinctive human trait, a universal and hereditary characteristic of mankind. Nearly all of the well-known text-books list this tendency among the instincts, either under the

heading of ownership or some similar name. Thus William James, in his *Principles of Psychology*, lists as one of the instincts that of appropriation or acquisitiveness and traces its beginnings to "the impulse which very young children display to snatch at, or beg for any object which pleases their attention." Other writers emphasize the presence of a similar tendency among many species of lower animals. Ants, bees, rats and squirrels build dwellings in which they lay up their supplies of food. The owl is said to bury its surplus supplies of food in much the same way as the dog buries bones. It is not true, however, that the storing up of food is universal or even typical of animal life. Most animals live completely in the present, consuming such food as falls to their lot without any foresight for the future.

Some of the lower animals are sometimes regarded as laying claim to the possession of certain territory which they defend against the inroads of the same or other species.

The lion lives alone or at most in a temporary family, but he needs a vast hunting ground. This territory must be well furnished with game and he chooses it himself. Having done so he will allow no intruder to poach there. He has fixed its boundaries on his own leonine authority. If another animal of his own species ventures to infringe upon the domain he has taken for himself, he protests, lays a complaint against the invader after his own fashion, and if the latter does not attend to him has recourse to the *ultima ratio* of kings and lions, a battle, the issue of which decides the judicial contest.

Making due allowance for something of over emphasis of the resemblance between human beings and lions in

this statement, such cases seem to be illustrative of a crude property sense in such animals. Letourneau, from whom the above quotation is taken, goes on to say that amongst birds the claim to the ownership of a certain ascertained territory is almost a universal fact. Some such claim to "the possession of a given territory is the very foundation, the first origin of property in the soil amongst human species."

OWNERSHIP AMONG PRIMITIVE PEOPLES

When we turn from consideration of the lower animals to human society in its various forms of organization, we find the institution of property in some form amongst all but a few peoples. It is true that some primitive tribes, like the majority of the lower animals, have no settled habitations and live from day to day without stores of food or other possessions. The Veddahs of the Ceylon woods have neither houses, artificial shelters, nor flocks, but "wander in very small hordes, always hunting, often hunted, and, like the Negroes of Borneo and Ceylon, seem in no condition to claim the exclusive ownership of hunting grounds."

Just a little superior to such peoples from the standpoint of customs relating to property are the Fuegians who, according to Darwin, by common consent have assigned certain fishing grounds of considerable extent to various groups. However, "foresight, care for the morrow, are almost unknown by the Fuegians. If they happen to kill a seal they gorge themselves with its flesh regardless of the future." Somewhat infrequently these people bury in the sand their surplus of food.

Among the Australian natives hunting grounds are parceled off as the exclusive property of a group and there is communal ownership of practically

everything including food and clothing. There are, however, certain rights of private property in connection with weapons and ornaments and particular utensils, many of these articles being buried with the individual at death, or else burned or broken. However, the Australian, like the Fuegian, has little foresight and the idea of preserving nourishment for the future does not enter his head. "In his hours of plenty he gorges without care for the morrow and when hunger, voracious hunger, is once appeased, he wastes and even voluntarily destroys what is left." Most authorities hold that amongst those tribes of primitive peoples where ownership of property is distinctly recognized that it is held in common by the entire tribe or clan or enlarged family.

ACQUISITIVE INSTINCT DOES NOT EXPLAIN PRIVATE PROPERTY

From the above descriptions of the lower animals and primitive peoples, it will be seen that there is a big gap between the manifestations of ownership by them and the practices and desires centering around the ownership of property in the form in which we have it today. Undoubtedly it is true that those animals which actually do store up food do so instinctively. There is little reason to believe that their activities in this respect are in any real sense the result of foresight on their part. A squirrel in captivity, for example, will take one (nut) between its teeth, then sit upright and listen in all directions. Finding all right, it would scratch upon the smooth blanket on which I was playing with it as if to make a hole, then hammer with the nut between its teeth upon the blanket, and finally perform all the motions required to fill up a hole—in the air; after which it would jump away leaving the nut, of course, uncovered.

It seems evident that such activities

amongst lower animals leading to the storing up of food supplies are no more than an extension of the food instinct, interesting, to be sure, in its analogy with human saving, but in no sense deserving to be classified as ownership. So, too, in the case of primitive peoples, acquisition is primarily acquisition of food for the satisfaction of immediate wants. The human organism, like all animal organisms, reacts to the presence of food and the bodily feeling of hunger by seizing and eating the food. To interpose between the stimulus and the act another instinct of acquisition and ownership seems to complicate the explanation by the addition of superfluous factors. The undoubted fact that primitive man held food supplies as well as many of their other possessions in common goes further to throw doubt on ownership as a distinct instinctive tendency. Personal property among these primitive tribes first appears in connection with weapons and utensils which are peculiarly related to the individual because of the labor he has performed to make them and the particular feats or accomplishments which he has been able to perform by means of them. Such possessions represent a sort of extension of the individual's body, the spear being scarcely less intimately related to his activities than the hand and arm which wield it. It dies, or should die, when he does, and for that reason is buried with him or broken or thrown away. For the same reason clothing, which at least among many tribes is merely ornamentation is peculiarly personal and intimate, serves at once as a mark of distinction and as a means of fostering feelings of expansion.

ORIGIN OF SAVING

Practices of acquisition and saving thus grow up quite naturally in response to the demands of a growing

personality and without reference to foresight and care for the future which we regard as fundamental to the notion of thrift. Primitive man being nomadic in his habits had little inducement to the storing of provisions, because such stores would be available only if carried from place to place and would, therefore, become a distinct encumbrance. Furthermore, in the absence of knowledge of how to preserve food, the natural tendency in the case of abundant supplies would be to use all that could be used and allow the rest to go to waste. Weapons and the almost negligible clothing would be practically the only objects in the experience of such people that would endure from day to day over any considerable period of time. To this statement, however, there must be made one notable exception. All primitive peoples know the use of fire and, as a consequence of the extreme difficulty of starting it anew, find means of preserving it. It is perhaps not too much to say that the beginnings of foresight and saving in the human species come as a result of the discovery of fire.

THE COLLECTING BENT OF CHILDREN

Most of the investigations of children with reference to ownership and saving have been colored by the view cited above that these are manifestly instinctive traits of both the lower animals and primitive man. Made at a time when the psychologists of this country were engaged in what is known as the child-study movement, such tendencies, like most other characteristics of childhood, were regarded as being merely outcroppings of racial history. The history of the individual recapitulates the history of the race. While there is much of significance in the parallels that may be drawn between racial and individual develop-

ment, it is now generally agreed by students of the mental life of childhood that these parallels hold good only in the vaguest ways and to an extremely limited degree. Man's mental life is so much determined by his environmental conditions that, even if the fundamental assumption of the recapitulation theory were correct, the principle would be useful only in a very limited way in the description and explanation of child behavior. It will, however, be well to summarize the chief investigations of this sort, for they undoubtedly reveal something of significance with reference to our problem.

The first is that of Klein and France, published in summary form in Hall's *Aspects of Child Life and Education*. The point of view of the authors may be seen in the following quotation:

The study of the child mind in relation to ownership takes on an increased interest and value if its property activities be regarded both as recapitulatory of the racial attitude to property and anticipatory of the adult's serious wrestling with property and fortune.

In answer to a request for a description of children who for the first time evinced signs of feelings of ownership returns were received from one hundred and eighty-five persons, describing such incidents in the life of children varying from 3 to 72 months of age. Typical replies are as follows:

F., 4 months. Cries whenever bottle is taken from her. Even if bottle was empty, would not let it leave her sight unless given another.

F., 4 months. Never showed sense of special ownership until another baby was brought to visit her. The second child was given F.'s rattle, whereupon F. began to cry and reach for it.

F., 48 months. When she was four years old everything that was given her she kept in a box placed in one corner of a room. She was much displeased if any one should even raise the lid of the box.

F., 72 months. Owned a ball of which she was very fond. Kept it hid where no one could find it.

It appears that those things which give satisfaction to the sensory side of the human organism are the earliest to be drafted in as property. Gradually objects that may be acted upon, that exercise the motor side, are laid claim to. The human infant, like the young of all vertebrates, reacts the earliest and most vigorously at all those points that give information about want-satisfying objects. It goes without saying that objects which satisfy these want points are the ones first claimed. It is not chance, then, that the highest per cent of objects claimed by infants 3 to 6 months of age should be those that satisfy hunger or are instrumental in doing so. In the second group—7 to 12 months—objects appealing to sight are far in the lead. Objects satisfying the sense of touch rank next, followed by those appealing to taste and smell (hunger). The eye soon becomes the chief mind feeder. Its objects have a permanency essential to the growth of the property concept. Objects that administer to bodily comforts, as a "special chair," "mother's lap," "a carriage," etc., begin to be appropriated at this age. Preferring certain spots in exclusion to others apparently as comfortable is a widespread animal trait. This is true of nearly all domestic animals. The third group—13 to 18 months—introduces for the first time articles of motion, for example, go-cart, buggy, toy engines, etc., and articles of dress. At this age the motor side begins its call for objects on which it may operate. In the fourth group—19 to 24 months—articles of motion are predominant. Articles used in imitation plays come in. The fifth group—25 to 36 months—shows that articles used in imitation plays are most frequently claimed and owned. The articles appropriated in the last group—37 to 72 months—are of a miscellaneous character. The most interesting and significant fact presented is the effort of the child to hide whatever possessed.

The sense of ownership finds expression in children not able to talk in those "expressive" movements of body: of the hands, reaching and clasping; of the feet, kicking; of the face, anger, pleasure, satisfaction; by

crying, laughing, and other characteristic sounds common to infants.

These are the objective facts noted by the observers. Here and there we get hints of the child's attitude—consciously and unconsciously—toward property. The following facts may be noted: (1) in every case from the youngest to the oldest, it was necessary that the child have the article entirely to itself; communism was out of the question. Extreme selfishness seems to be the rule. (2) Generally the child does not lay claim to an object until it sees the object in the possession of another, or when some one else tries to take the article; in fact, at this point the sense of ownership first gives itself definite objective expression. (3) The extreme forms of isolation and exclusion, two fundamental elements in the sense of ownership, crop out in the child hiding its possessions. I have found no case of hiding articles under four years of age. (4) The child may have a fairly clear idea of possessing an article himself, while not conceiving the same feelings to be present in any other child.

A second investigation pertinent to our inquiry dates from the same period. It is entitled "The Collecting Instinct," and reports the results of a study based on returns from 1,214 California children who were asked to give information concerning any collections they had ever made. The most striking result was the discovery that the collecting interest was practically uni-

versal. Only 10 per cent of the boys and 9 per cent of the girls were not actively engaged in making collections at the time, while only 3 per cent of the boys and 1 per cent of the girls said they had never made any collections. Counting present and past collections these children had made an average per child of five different collections. An alphabetic list of the objects collected contains 215 names, ranging from acorns, arrowheads and autographs to weapons, wrappers and zoölogical specimens.

Certain collections stand out much more prominently than others, especially cigar tags, stamps, birds' eggs, marbles, and shells. These are prominent among both boys and girls, though all but shells much more so among the boys. Certain collections rank high, but more particularly among the girls, as picture cards, pictures, buttons, pieces of cloth, silk, etc., dolls, paper dolls. Then follow some, as books, rocks, leaves, flowers, ribbons, and others, which have a fair following. The remaining classes of collections were made by only a few children, and ninety-seven kinds were made by only one child each. . . .

It will be seen that the boys concentrate more on a few things which run as crazes through very many groups. About three fifths of the boys had collected cigar tags and stamps, and nearly half of them had collected birds' eggs. Nothing attains such widespread interest among the girls, al-

	BOYS' MOTIVES Per Cent	GIRLS' MOTIVES Per Cent
Imitation (because others did)	29	25
Rivalry (to get as many or more than others)	2	4
Quantity interest (to see how many)	20	15
Interest in kind (to see how many kinds)	3	6
Indefinite	8	6
Enjoyment, use, of objects	7	10
Pastime (pleasure in collecting)	4	3
Interest in objects collected	7	9
Aesthetic attraction of objects	3	8
Commercial motive	7	2
Souvenir interest	2	5
Miscellaneous	8	7

though between thirty and forty per cent of them had collected stamps, shells, and picture cards, but a greater number of things have considerable runs with them. . . . Only seven things were collected by ten or more per cent of the boys,—cigar tags, stamps, eggs, marbles, shells, buttons, and rocks; while sixteen things were collected by ten or more per cent of the girls,—including the same things as in the case of the boys, except rocks,—all in the following order: stamps, shells, picture cards, cigar tags, buttons, pictures, marbles, pieces of cloth, etc., paper dolls, dolls, eggs, books, leaves, sea mosses, pressed flowers, and ribbons.

The table on page 160 gives the motives which the children reported for making the collections:

HOW CHILDREN REGARD MONEY

The only investigation dealing directly with the child's attitude towards money is that of W. S. Monroe, entitled "The Money Sense of Children." The question was asked 2,012 Massachusetts school children: "If you had 50 cents a month, what would you do with it?"

The following table shows the distribution of the replies:

	BOYS	GIRLS
Clothing	9%	11%
Food, coal, food or furniture	4	4
Toys and pictures	3	7
Candy, riding, etc.	14	9
Philanthropy	2	3.5
Christmas presents	4	7

In response to the further question, "What would you do with \$1,000 if you had it?" 98 per cent of the boys and 72 per cent of the girls replied that they would save it.

The writer undertook a somewhat similar inquiry among the pupils from the fourth to the eighth grades of the schools of Urbana, Illinois. The children of the fourth grade were asked:

(1) "How much of things to eat will \$1.00 buy?"

(2) "How much of things to wear will \$1.00 buy?"

(3) "How much of other things will \$1.00 buy?"

(4) "How much money have you saved up?"

(5) "What are you going to do with it?"

The children of the other grades were asked the same questions, except that \$3.00 was substituted for \$1.00 in the case of the fifth and sixth grades, and \$5.00 in the case of the seventh and eighth grades.

The replies reveal an astonishingly low degree of understanding of the value of money in terms of what it will buy of food and clothing. This ignorance of money values in such terms while it grows less as the children increase in age is still quite striking in children of the average age of fourteen in Grade VIII. Individual cases of quite exact knowledge in respect to clothing values stand out in striking contrast to the majority and are usually found to be those cases where they state that they are saving for the specific purpose of buying clothes. In answer to the third question, however, these children in general selected articles, usually playthings, or other highly desired articles, the prices of which were well understood.

The replies to the fourth and fifth questions revealed rather surprising differences in the habits of thrift of the children attending the various schools, and varying somewhat with what might be termed the "social status" of these children. In the Leal School, for example, which is the school attended by the children of the more prosperous citizens, an average of 86 per cent of all children (fourth and fifth grades) have savings, while in the Webber School the corresponding average is 42 per cent;

the Lincoln and J. W. Hays schools take an intermediate position. The latter school, however, in the fourth grade is a notable exception, as 80 per cent of the children report savings, showing that some special factor, perhaps a teacher's influence is at work here. Frequently the sums which have been saved by the poorer class of pupils are quite large, showing that these individuals have acquired some degree of earning capacity.

The most striking evidence of differences in habits of thrift comes from a consideration of the children of the seventh and eighth grades. The children of these schools are divided into four sections for each grade, corresponding to the ability which they are believed to possess to do the work of the school. Thus Grade VII.1 contains the brightest of the seventh-grade pupils and VII.4 the dullest. The percentage of those reporting savings in these grades was as follows:

	%		%
VII. 1.....	93	VII. 4.....	70
VIII. 1.....	100	VIII. 4.....	60

The amount of money reported as having been saved varies all the way from twenty-five cents to \$3,000. In the upper grades the amounts reported are almost universally of considerable size.

The replies to the fifth question reveal some interesting facts as to the motives which lead children to save. The most frequent reply to this question is that the child is just saving his money with no definite purpose. As one pupil expressed it, "I am going to keep it, as I may need it badly some time." A number refer to the proverbial "rainy day." This more indefinite motive for saving increases with age and with higher social status. It is also more characteristic of the bright pupils of the seventh and eighth

grades than of the duller pupils. Fifty per cent of the VIII.1 pupils give this type of reply to the fifth question.

The next most frequently received reply to this question was that the money was to be used for buying clothing. The poorer children give this as their purpose much more frequently than any other reason, and the younger children give it quite as frequently as the older.

The only other frequently mentioned purposes of saving are the purchase of bicycles and Christmas presents and defraying expenses of further education. Twenty-five per cent of the VIII.1 group give the latter motive for saving. Most of the remaining replies relate to the gratification of individual desires which are of little further interest.

THRIFT—A HABIT RATHER THAN INSTINCT

The net conclusion of our study of ownership, whether from the standpoint of racial development or of individual development, is that the accumulation of property and its preservation are the results of long continued training and habituation rather than an instinctive trait. Doubtless there are instinctive factors at work here as everywhere else in human behavior, but thrift is by no means so native to the race that its appearance may be taken for granted. On the contrary, human nature on the purely instinctive level is improvident and wasteful, prompted by the satisfaction of immediate desires and careless of the future. Habits of economy arise as a result of painful experience of want, supplemented by intelligent planning for the future.

Habits of saving, like all other habits, may be developed in the young by proper instruction, but such habits

must be based on more than the mere academic imparting of ideas. Instruction may result in a shortening of the time to produce such habits, but it must be supplemented by experience. In the absence of handling money in buying and selling, children cannot be expected to understand money values. Money represents an extremely abstract way of effecting exchange of goods and it is small wonder that the child and indeed many adults comprehend so little as to its meaning. The child's habits of saving should, therefore, be connected closely with the actual expenditure of money. Further understanding and enriching of the child's attitude towards money comes from the experience of earning money for himself, for in no way can the sense of the value of money be obtained so well as by measuring it against the amount of energy one puts forth in securing it in return for work.

PROPERTY AND SOCIAL PERSONALITY

In conclusion, some of the broader effects of economy and accumulation of property on the individual and his social relationships may be noted. The possession of property has a peculiar influence on a person's feeling of worth and, for that reason, is an incentive to renewed activity and endeavor. Our possessions, everything which we call "ours," are in a very real sense parts of our very selves. William James has made this point so aptly that I quote him at length:

. . . In its widest possible sense a man's Self is the sum total of all that he can call his, not only his body and his psychic powers but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works, his lands and horses, and yacht and bank-account. All these things give him the same emotions. If they wax and prosper, he feels triumphant; if they dwindle and die away, he feels cast down,—not necessarily in the

same degree for each thing, but in much the same way for all.

The body is the innermost part of the material Self in each of us; and certain parts of the body seem more intimately ours than the rest. The clothes come next. The old saying that the human person is composed of three parts—soul, body and clothes—is more than a joke. We so appropriate our clothes and identify ourselves with them that there are few of us who, if asked to choose between having a beautiful body clad in raiment perpetually shabby and unclean, and having an ugly and blemished form always spotlessly attired, would not hesitate a moment before making a decisive reply. . . . We all have a blind impulse to watch over our body, to deck it with clothing of an ornamental sort, to cherish parents, wife and babes, and to find for ourselves a home of our own which we may live in and "improve."

An equally instinctive impulse drives us to collect property; and the collections thus made become, with different degrees of intimacy, parts of our empirical selves. The parts of our wealth most intimately ours are those which are saturated with our labor. There are few men who would not feel personally annihilated if a life-long construction of their hands or brains—say an entomological collection or an extensive work in manuscript—were suddenly swept away. The miser feels similarly towards his gold, and although it is true that a part of our depression at the loss of possessions is due to our feeling that we must now go without certain goods that we expected the possessions to bring in their train, yet in every case there remains, over and above this, a sense of the shrinkage of our personality, a partial conversion of ourselves to nothingness, which is a psychological phenomenon by itself. We are all at once assimilated to the tramps and poor devils whom we so despise, and at the same time removed farther than ever away from the happy sons of earth who lord it over land and sea and men in the full-blown lustihood that wealth and power can give, and before whom, stiffen ourselves as we will by appealing to anti-snobish first principles, we cannot escape an emotion, open or sneaking, of respect and dread.

The increased feeling of independence and self-importance which comes as the result of accumulation, together with the social recognition of success, may give a powerful "drive" towards the fostering of the habit of saving and serve to supplement the influence of intelligent provision for the needs of the future.

NEED OF INTELLIGENT CONTROL

However, the demand for social recognition may easily become, if not intelligently checked, the fundamental motive for lack of economy and the formation of habits of spending. Take in this connection, for example, the matter of clothes to which James has alluded in such a forceful way. Over and above the reason that clothes are necessary for protection, it is clearly legitimate to spend money on clothes because of the increased self-respect they bring. But who can doubt that a very large source of waste is to be found in excessive expenditures on clothes for purposes of display? At still another level comes the "urge" to spend on amusements, recreation, food to tempt the taste rather than for nourishment, etc. These, too, may be legitimate objects of desire, but must find their proper place in a system of values. Here again we find the necessity of intelligent planning in order to assign proper values to the various objects and activities that we crave to satisfy our desires. A budget system is in reality just such a well-thought-out assignment of values, and, therefore, serves as a check on unwise and impulsive spending. It is especially useful when goods are bought on credit,

or the installment plan and payment is made by checks, all of which convenient and legitimate means of commerce nevertheless tend to obscure the sense of values that would come from direct exchange of goods.

Finally, it should be noted that the problem of saving necessarily will have to be solved ultimately by every individual on the basis of a more or less complete philosophy of life. Psychology, no more than any of the other sciences, can determine the relative values of the different attitudes which may be cultivated towards various modes of living. In case of the individual whose philosophy of life is expressed by "Let us eat drink and be merry for tomorrow we die" there can be no motive for saving. On the other hand, it is easy to elevate the needs of a vague and indefinite future to such a degree as to rob the present of all significance. Every thoughtful person would agree that these two extreme attitudes should be avoided, but it is no easy task to steer one's ship between the Scylla of improvidence and self-gratification on the one hand, and the Charybdis of greed and miserliness on the other.

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The Psychological Corporation

By J. McKEEN CATTELL

THE Psychological Corporation was granted a charter by the state of New York on April 28, 1921, its objects and powers being defined as the "advancement of psychology and the promotion of the useful applications of psychology." The certificate of incorporation provides that no dividend in excess of six dollars a share shall be paid during any calendar year and empowers the American Psychological Association to take over any or all of the stock on payment of one hundred dollars a share. The stock was subscribed for and is now held by about 170 psychologists active in the work of the Corporation. The thousand shares have no par value; they were allotted to psychologists at a valuation of ten dollars a share and each stockholder is expected to give without payment services to the Corporation that will make the ultimate value of the shares one hundred dollars. As the maximum dividend is 6 per cent on this valuation and as the Psychological Association can take over the stock, the owner can make no profit beyond interest on the money subscribed and payment for services rendered. All profit that accrues from the work of the Corporation must be used for psychological research.

OFFICERS AND DIRECTORS

The directors of the Psychological Corporation named in the act of incorporation were elected by the stockholders; there has been no change except to fill the vacancy caused by the death of Professor George Trumbull Ladd of Yale University. The directors are:

James R. Angell, Yale University.
W. V. Bingham, Carnegie Institute of Technology.

J. McKeen Cattell, The Psychological Corporation.

Raymond Dodge, Wesleyan University.

S. I. Franz, Government Hospital for the Insane.

G. Stanley Hall, Clark University.

H. L. Hollingworth, Barnard College, Columbia University.

Charles H. Judd, University of Chicago.

William McDougall, Harvard University.

W. B. Pillsbury, University of Michigan.

Walter Dill Scott, Northwestern University.

C. E. Seashore, University of Iowa.

Lewis M. Terman, Stanford University.

Edward L. Thorndike, Teachers College, Columbia University.

E. B. Titchener, Cornell University.

Howard C. Warren, Princeton University.

Margaret Floy Washburn, Vassar College.

John B. Watson, The J. Walter Thompson Company.

R. S. Woodworth, Columbia University.

R. M. Yerkes, The National Research Council.

At the first meeting of the directors on June 2, 1921, Dr. Cattell was elected president; Dr. Scott, first vice-president; Professor Terman, second vice-president; Professor Thorndike, chairman of the directors; Professor Dodge,

Professor Woodworth and Dr. Yerkes, members of the executive committee in addition to the president and the chairman. Dr. Dean R. Brimhall was elected secretary and treasurer. He is the only officer who receives a salary and devotes his time primarily to the work of the Corporation. On November 1, 1921, the secretary took up his active work and centrally placed offices were occupied in the Grand Central Terminal, New York City.

BRANCHES AND ASSOCIATES

The Corporation is empowered by its charter to establish and maintain branches and offices and to conduct its business in any state or part of the United States and in foreign countries. The establishment of state branches was taken up promptly. There are now branches with executive officers as follows:

Massachusetts: Professor William McDougall; Professor Herbert S. Langfeld.

Pennsylvania: Director W. V. Bingham.

Maryland: Professor Knight Dunlap.

District of Columbia: Dr. S. I. Franz; Dr. H. C. Bingham.

Ohio: Dean George F. Arps; Professor Harold E. Burt.

Michigan: Professor G. M. Whipple; Professor H. F. Adams.

Illinois: President Walter Dill Scott; Professor Frank N. Freeman.

Iowa: Dean C. E. Seashore; Professor Bird T. Baldwin.

Kansas-Missouri: Professor Max Meyer.

California: Professor Lewis M. Terman; Professor Warner Brown.

Branches are also in course of organization in Indiana, Minnesota and other states.

There are 457 members of the American Psychological Association and some 150 others having nearly the same qualifications, namely, a training represented by the doctorate of philosophy, the publication of research and professional occupation with psychology. The number is small as compared with teachers, physicians or engineers; a compact and efficient organization is possible. These psychologists have all been communicated with, and only three (two of them practicing psychiatrists) expressed misgivings as to coöperation. The directors of the Corporation, the officers of the branches, the executive heads of the stations and the other psychologists associated with the Corporation, are the leaders in psychology in America and are in large measure the creators of the science as it now exists. They include men such as President Hall, Professor Titchener and President Angell, whose research and publications have been remote from applied psychology, as well as those responsible for the organization of the applied work in the schools, in the army and in industry.

The names of some of those concerned with the work of the Psychological Corporation and the institutions with which they are connected will be known to all men of affairs, indeed to most readers of the daily press. In recent years psychology has become a word to conjure with; for this very reason it calls up all kinds of spirits. In addition to the roll of competent psychologists of the country, the secretary of the Corporation has compiled a black list of charlatans and ignoramuses, and a gray list of camp followers. Such lists cannot well be published; but the Corporation guarantees the training and standards of those associated with it. The "average person" has no means of knowing whether Mr. X—who probably calls himself Dr.

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X—is a scientific man or a charlatan. To let the general public know what psychology can and what it cannot do and who can and who cannot do it is one of the useful by-products of the organization of the Corporation.

OBJECTS OF THE CORPORATION

The Corporation and its branches are essentially a holding company for psychologists, providing means of contact among them and with the general public. There is no present intention of establishing laboratories or employing salaried experts. The Corporation as such does not propose to make individual examinations, to engage in industrial management, or even to undertake research. The work will be done in existing laboratories and wherever there are competent psychologists. Stations are in course of establishment in cities and institutions throughout the country; of these there will ultimately be not fewer than one hundred. To these stations will be referred research that can be placed on a business basis; they will be prepared to make standardized psychological tests; in some cases they may make personal examinations and give vocational guidance, on the one side, or may engage in job analysis, efficiency engineering and the like, on the other. But the advancement of psychology by research is the primary object of the Corporation, its branches and its stations.

The Psychological Corporation does not seek endowments or subsidies, though it is ready to administer funds as a trustee or agent. In the past nearly all research has been dependent on charity, primarily that of the scientific man himself, who earns his living in other ways and does scientific work as an amateur. In recent years, however, universities have come to regard research as a part of the work for which professors are paid; fellowships have

been endowed; research institutions have been established; grants are made by endowed foundations; the Government supports research from taxation. The influence of the Corporation will be exerted to increase endowments and subsidies for psychological research and to forward support by federal, state and city governments, public school systems and other tax-supported institutions.

In the applications of psychology the Corporation is not so much concerned with arranging specific contracts for work by it or under its auspices, as in promoting the extension of applied psychology and the improvement of the methods used. Nearly all the psychologists of the country are united in the Corporation; it makes but little difference whether a psychologist makes arrangements directly or through the Corporation. The important thing is that the work be done by a competent psychologist and in the best way. The Corporation has proved itself useful, and it will become more and more useful by increasing the demand for applied psychology; by informing business and industry what psychology is able to do and who is competent and reliable; by serving as an exchange by which work can be transferred to places and persons where and by whom it can be done to the best advantage.

In the Corporation psychologists have an organization through which business arrangements can be made. We are continually asked for free advice and assistance. There is no reason other than precedent why professional service should be given free by psychologists to a greater extent than by physicians, lawyers or engineers. If well-to-do people and organizations can be referred to a station of the Corporation, a proper fee can be arranged, with a margin, such as the Mayo Clinic and other hospitals ob-

tain, to cover cases where there should be no charge and to defray the cost of research that will improve the methods.

PSYCHOLOGICAL TESTS

A useful service will be supplied by providing for standardized psychological tests in all parts of the country. The army work has shown what can be accomplished in the selection of individuals and for science by making such tests on a large scale. It is now possible to take the army intelligence tests at a cost of five dollars at any one of the stations of the Corporation. It is of interest and may be of practical value for a person to ascertain where he stands with respect to the 1,800,000 army recruits in the kind of intelligence measured. The data collected under the auspices of the Corporation may become of much scientific value in the study of race, sex, class, age and other differences.

The mental age measurements are of special value. Some three million psychological tests were given to children in the public schools last year with a view to determining their progress and the classes to which they should be assigned. These examinations are usually made on large groups. It is a great advantage if a parent, on payment of a moderate fee, can have a child specially examined to determine whether the school examination and assignment are correct. More detailed information than the schools are likely to provide is desirable; a child whose calendar age is 10 may have an age of 11 in his social reactions, of 12 in reading, of 8 in arithmetic. Such outside examinations will also be of use in maintaining adequate standards in school systems; they are essential for private schools that do not want to fall behind the public schools.

The psychological tests are particu-

larly useful at the time of entering high school and college. The whole future career is then determined, usually by financial conditions, often by chance circumstance, whereas the ability of the student to do well should be the chief factor. This can be predicted with a high degree of validity by a psychological test lasting one to three hours, costing five to ten dollars, or less if in groups. In half the cases the writer would be prepared to pay the entire cost of a student's high-school or college course in case he did not get through when the test predicted that he could, or got through when the test predicted that he could not, if the parent would pay an equal sum in case the prediction were not verified. The tests also indicate in what kind of course the student will do best—in a commercial or literary high school, in an engineering or liberal arts college.

There are special tests, such as for talent in music and drawing, that are useful. Indeed a determination of individual differences in the senses, in motor reactions, in memory, imagery and association, would always be interesting and often of practical value. A test of sharpness of hearing that can be made in ten minutes at a nominal cost may be of assistance in the affairs of daily life; the measurement of the change in such a trait at different ages may be of great use. We need to work out age curves showing the age at which different kinds of activities can be acquired to best advantage; at which different kinds of ability are at their maximum; how they rise and decline; how individuals differ. The value to the person tested is far more than sufficient to pay the cost of the work, which at the same time will advance psychology as a science.

By tests such as these, the modest overhead expenses of the Psychological Corporation, its branches and stations

can be met; at the same time employment can be given to many psychologists. A graduate student could earn his expenses through the university by making two standardized tests a day and at the same time obtain training useful to him. More experienced psychologists can make personal examinations that may ultimately become as essential as those of the physician. Here the Corporation may be of service in maintaining high standards of skill and honesty and by letting the public know who have such qualifications.

PSYCHOLOGICAL RESEARCH IN BUSINESS

Manufacturers and business men are psychologists in the selection of employes and in dealing with them, in buying and selling, in the whole conduct of their affairs, to the extent that farmers are biologists in raising plants and animals. In both cases tradition and everyday intelligence should be supplemented by scientific methods. Agricultural productivity has perhaps been doubled, industrial productivity has perhaps been quadrupled, by science and invention. There is every reason to believe that psychology in the coming century will parallel the service rendered in the past century by the physical and biological sciences. By selecting individuals for the work for which they are best fit, by training them in the best ways for the work, by arranging conditions so that the work is most efficient, we can again increase the average wealth that each will create and may enjoy.

It is easy to give examples of definite directions in which psychology can at present be of use beyond its cost and in which the service could be enhanced by research that it would be profitable to undertake. Thus there are three types of people intergrading but often well defined—those most satisfied and competent when dealing, respectively,

with persons, with material objects, and with abstractions such as words and figures. In the transportation services most of the employes have functions separated on the lines of these three types. The clerks, bookkeepers and stenographers are concerned with words and figures. The conductors and pursers must remember faces, be obliging, ready to answer questions, interested in the affairs of the passengers; these traits are disqualifications for motormen and engineers, who should be concerned about objects and machines. By a rough natural selection those tend to become clerks, conductors or engineers who are best suited for the work, but probably over 10 per cent of the employes could be transferred with an average increase of more than 10 per cent in their efficiency; new employes could from the start be assigned to work for which they are best fitted. By the use of the psychological tests that we now have and by research to perfect these tests, the corporations concerned with transportation could effect a direct saving measured by tens of millions of dollars a year, indirectly of a comparable sum through the greater welfare and contentment of their employes.

Apart from the suffering they cause, the cost of accidents and deaths in transportation, factories and mines is enormous. These accidents could be avoided in large measure by proper selection of men for the work they do, by correct training to meet its contingencies, by the adjustment of machines and conditions to suit the human mechanism. This is a psychological situation now partly within our control, one that can be solved by research. There are numerous other problems—the hours of labor, fatigue, interest, good will, efficiency and the like—in which psychological research would repay its cost manyfold. It is the

business of the Psychological Corporation to convince men of affairs of the correctness of this statement and then to provide them with the services of the psychologists who can best do the work. The coöperation of organized labor is of equal importance; an extensive correspondence with Mr. Gompers indicates that the unions may realize the desirability of taking up the work under their auspices.

THE PROFITS OF RESEARCH

In the past, scientific research has been supported in the main by gifts and by taxation. In recent years, however, industrial laboratories have become important factors in the advancement of physics, chemistry and pharmacology; they are indeed now rivalling the laboratories of universities, of research institutions and of the Government in their contributions to science. Business men have learned that it pays to conduct research even in directions in which the results are not immediately or obviously useful. Concerns that cannot afford a permanent laboratory, but want specific problems solved, have used the method of industrial fellowships. At the Mellon Institute of the University of Pittsburgh, some seventy young men and women are engaged in chemical research for which they are paid over \$200,000 annually.

The organization of business on a large scale enables it to undertake profitable research in some directions. An electric lamp, the creation of research in the physical sciences, is worth two to twenty times its cost. The General Electric Company can benefit the consumers as well as society by adding a fraction to the cost of production to be used for research to improve the lamp or even to promote pure science on the chance that it may ultimately be of use. A telephone call, the child of invention and science, is likely also

to be worth many times what it costs. The American or the New York Telephone and Telegraph Company serves the user and the general public by charging a margin above the cost to improve by research the service and the sciences on which it depends. Similar conditions obtain in chemistry and in pharmacology.

For psychology the situation is more complicated. It is indefinitely more important to get better men than to get better lamps, telephones, dyes or drugs. It is equally feasible, equally dependent on scientific research; but it is more difficult to secure the means to conduct the work. The electric companies and the telephone companies do not at present realize that they might be aided by psychological research almost as much as by research in the physical sciences. They must select their employees; they want a maximum of service with the greatest contentment and welfare; they need to avoid equally discontent and preventable accidents; they want the good will of the public; they must sell their goods; they need to know more about the senses of vision and hearing.

The Psychological Corporation aims to accomplish for psychology what the industrial research laboratories are doing for the sciences with which they are concerned. Organized effort is particularly needed in psychology. We have a science whose applications may become of as great economic importance as the combined applications of all the sciences of energy and matter, including the living organism. Indeed the other sciences and their applications are in a sense dependent on psychology; their development is due to human insight and skill; their ultimate object is the satisfaction of human needs and the promotion of human happiness. To get the best kind of people and to put them in the situations in which they

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will behave in the way best for themselves and for others, is more fundamental than any other enterprise of society.

It is necessary to organize means by which this work can be accomplished. It may be hoped that the rich will give even larger amounts than in the past for the support of education and science, that the people will increasingly use for these purposes the machinery of taxation and government. But if we can place scientific research on an economic basis, so that production will be paid for in proportion to its value to society, we shall cause an inflection point in the upward curve of progress.

RESEARCH AND SOCIAL PROGRESS

Psychology is concerned with the causes of conduct and its control. It is consequently fitting that psychologists should take the lead in effecting an organization that will adjust their work to the conditions of our modern industrial and democratic society. In forming vast trusts to control industry and in giving part of the profit to other trusts for education, science and charity, Mr. Rockefeller and Mr. Carnegie have by intuition begun the adjustments which self-conscious psychology should place on a scientific basis. The applications of science, by quadrupling

the average production of wealth by each individual and by doubling the average length of life, have made possible universal education and democracy. We have passed the age when a hereditary aristocracy, supported by serfs, was needed to provide for education and science; we are now leaving the period of individual competition tempered by charity. Corporations and trade unions are the dominant forces in our modern social order.

Scientific research, which has created our civilization, cannot depend for its future support on social conditions and incentives which it has itself made obsolescent. It cannot be left to charity, or to a leisure class and the leisure time of those otherwise employed; it cannot rely on instincts, such as curiosity and emulation, or on irrational rewards, such as reputation and honors. Scientific research must become self-supporting and this can best be accomplished by the organization of those engaged in the work to conserve for it part of the wealth that it creates. The Psychological Corporation is such an undertaking; its objects and methods deserve the attention not only of other scientific men, but also of practical economists and men of affairs.

Psychological Work of the National Research Council

By ROBERT M. YERKES

THE National Research Council was organized in 1916 under the auspices of the National Academy of Sciences and the Engineering Foundation, primarily to place the scientific resources of the country at the command of the federal Government. After the war it was perpetuated at the request of the President of the United States under the federal charter of the National Academy of Sciences.

The following description of the organization and purposes of the Council is modified somewhat from that appearing in the report of the organization for the year 1921-22.

PURPOSE AND ORGANIZATION OF COUNCIL

The Council is a coöperative organization of the scientific men of America, including also representatives of engineering and business. It has the active coöperation of the principal scientific and technical societies of the country and its membership consists chiefly of representatives nominated by these societies. Its essential purposes are promotion of research in the physical and biological sciences and encouragement of the dissemination and application of scientific knowledge.

The organization comprehends thirteen major divisions, of which seven, the Divisions of Science and Technology, concern respectively physics, mathematics and astronomy; chemistry and chemical technology; geology and geography; biology and agriculture; anthropology and psychology; the medical sciences and engineering. The remaining six divisions designated as Divisions of General Relations are concerned with foreign relations, federal

relations, states relations, educational relations, research extension and research information.

Each of these major divisions has its subdivisions and special committees. In addition, the Council has an executive board and various other committees. Its general administrative officers are a chairman, three vice-chairmen, a permanent secretary, a treasurer and a chairman of each major division. All of these, with the exception of the secretary and treasurer, are elected annually.

The Council is neither an operating scientific laboratory nor a repository of funds to be distributed to investigators or institutions. Instead, it is an organization which, while recognizing the unique value of individual work, especially endeavors to assist in coördinating research and in furthering the organization and support of undertakings which demand the coöperation of individuals, institutions, or both.¹

Since its organization in 1919 the Council has received from foundations, industrial corporations and individuals, gifts or pledges amounting to approximately \$8,000,000. These gifts are designated as for building site, construction of building, general endowment, or special research projects. The Council is not a governmental agency and it is not supported by federal appropriation.

In this article we are concerned primarily with the activities of the psychological section and committees of

¹ For more detailed information about organization and activities of the National Research Council as a whole, the reader is referred to the annual reports which are available on request from the Office of Publication, National Research Council, Washington, D. C.

the Research Council. It will be impossible to present a complete and adequate account of all psychological activities, but examples of major interests and undertakings can be described.

WAR STUDIES

In 1917 the Council organized a Committee for Psychology which continued to be active until 1919, when through the reorganization of the Council it was replaced by the Division of Anthropology and Psychology. The psychological committee, as is already well known, through its several sub-committees conducted and promoted various forms of inquiry and constructive endeavor for the assistance of the army and navy during the World War. It must suffice here to refer to the principal official reports and supplementary publications which originated from the activities of the Committee for Psychology of the National Research Council and the Committee on Classification of Personnel in the Army.²

² (1) "Psychology in Relation to the War." By Robert M. Yerkes. *Psychological Review*, vol. 25, 1918, pp. 85-115.

(2) Report of the Psychological Committee of the National Research Council. By Robert M. Yerkes. *Psychological Review*, vol. 26, 1919, pp. 83-149.

(3) Psychological Examining in the United States Army (official report). *Memoirs of the National Academy of Sciences*, vol. 15, 1920, Washington, D. C. Quarto vi+890 pp. (Available through the Superintendent of Documents, Washington, D. C.)

(4) The Personnel System of the United States Army (official report). Volume 1, History of the Personnel System; Volume 2, The Personnel Manual. Published by the War Department, Washington, D. C., 1919. (Available through the Superintendent of Documents, Washington, D. C.)

(5) "Army Mental Tests." Edited by C. S. Yoakum and R. M. Yerkes. *Henry Holt & Co.*, New York, 1920. xiii+303 pp.

(6) "The Intellectual and Educational Status of the Medical Profession as Represented in the United States Army." By Margaret V. Cobb

NATIONAL INTELLIGENCE TESTS

Immediately following the war and before completion of the organization of the Division of Anthropology and Psychology, the National Research Council organized a special committee which, with the financial support of the General Education Board, prepared for school use the National Intelligence Tests. This task required the greater part of two years. It resulted in the issuance, through the coöperation of the *World Book Company*, of two practical scales, each of which consists of five tests, for measuring the intelligence of children. The National Intelligence Tests have been extensively used throughout the United States since their issuance in 1920. The Division of Anthropology and Psychology, on the basis of royalties received through sale of test materials, maintains a special committee for revision and supplementation of the tests and the provision of increasingly useful norms or standards of comparison.

POLICY OF COÖPERATION

At one of its early meetings the Division of Anthropology and Psychology formulated the following statement of policy relative to functions:

The functions of the Division are (a) coördination of research activities in progress or in prospect; (b) encouragement of the development of research personnel (1) by systematic search for promising material (2) by furnishing to possible research students information about facilities and opportunities, and (3) by furthering the establishment of fellowships and facilities for training; (c) the fostering of a small number of selected research projects, and (d) service in an advisory capacity relative

and Robert M. Yerkes. *Bulletin of the National Research Council*, vol. 1, no. 8, 1921. 76 pp.

(7) "A Study of American Intelligence." By Carl C. Brigham, *Princeton University Press*, Princeton, N. J., 1923. xxv+210 pp.

to research projects within the field of the Division when such counsel is requested by duly constituted agencies.

The most recent statement of policy is contained in the report of the Division for 1922-23 which reads:

The policy of the Division of Anthropology and Psychology as established by its traditions, in accordance with its interpretation of the functions of the Council, lays chief emphasis on research programs which involve coöperation with other sciences, on technical service in the applications of anthropology and psychology to practical affairs, and on such fundamental research in anthropology and psychology as seems to require the coördination of widely separate agencies and sustained attack.

The Division has coöperated effectively with the Department of War, the Department of the Navy, and various other federal agencies, in furthering the study of problems of personnel and in consolidating and rendering of permanent advantage the war-time contributions of psychology to personnel administration. Particularly it has been instrumental in furthering the organization of the Personnel Research Federation, of which the official organ is the *Journal of Personnel Research*, and the Bureau of Public Personnel Administration of the Institute of Government Research.

The first large coöperative project in research planned by the Division of Anthropology and Psychology was the anthropological and psychological study of the peoples of the United States. This project has progressed slowly because of lack of financial support.

The income of the National Research Council barely suffices for necessary administrative expenses.³ It is rarely that any considerable sum from this undesignated income can be devoted to the promotion of special investigations.

³ Most gifts are for specific purposes and cannot be used otherwise.

Consequently, the formulation of plans for research by a division is a waste of effort unless ways and means of financing the proposed investigation can be devised, or at least suggested to the Committee on Promotion of the Research Council. Many of the most important research projects presented to the Council and approved by its Board are in abeyance simply because of lack of funds.

PROJECTS APPROVED

It may not be amiss to list by title several of the "projects" which the Division of Anthropology and Psychology has approved and undertaken to promote. Of sixteen projects which were presented to the Division during one year, the following were approved and favorably recommended to the Executive Board of the Council:

(1) Study of the American people: an anthropological and psychological research on selected groups in the United States; (2) prediction of success by students entering institutions of higher learning; (3) organized search for research talent among college students; (4) establishment of a journal for the publication of psychological abstracts; (5) study of intermarriage and race intermixture in Hawaii; (6) archaeological survey of the states of Illinois, Indiana, Iowa and Missouri; (7) relation of intelligence and schooling to occupational ability. To this list may be added as additional examples: coöperative study of vestibular functions; the organization of various special conferences and the preparation of reports on the use of methods of mental measurement, psychology as a career and psychological personnel of America.

HOW THE COUNCIL OPERATES

A few examples of the psychological activities of the Research Council will now be described somewhat more fully,

in order that the modes in which it operates may be made clear.

In coöperation with the Research Information Service, the Division of Anthropology and Psychology has assembled much information relative to the status, relations and needs of psychology in America. Particularly it has made a survey of current psychological research, has assembled information about all psychologists of research status and has issued a report on the interests and activities of psychologists.⁴

In addition the Research Information Service has supplied to many lay as well as professional correspondents data concerning psychological methods, resources and personnel. It has thus been of very considerable usefulness to business interests as well as to educators, engineers and scientists.

For the past three years, particular attention has been given to the discovering and development of investigators. Conferences have been held in many educational institutions, ways and means of discovering special ability and of providing for its development have been devised and recommended for use, publications relative to the importance of discovering and developing persons of unusual ability have been widely distributed, and in various other ways interest in "the search for research talent" and appreciation of its importance have been fostered. In this work the Division of Anthropology and Psychology has coöperated effectively with the Division of Educational Relations.

Other phases of the great problem of personnel have been dealt with by the Council in special conferences.

⁴ "Mechanical Aids for the Classification of American Investigators with Illustrations in the Field of Psychology." By Harold C. Bingham. *Bulletin, National Research Council*, vol. 4, 1922, 50 pp.

Thus, as already indicated, the Council has assisted in organizing two important personnel agencies, the one a national society called the Personnel Research Federation,⁵ the other a special research organization known as the Bureau of Public Personnel Administration.⁶ Both testify to the growing appreciation of the importance of personnel research and the desirability of systematic provision for the dissemination of information, as for example, through the *Journal of Personnel Research*⁷ of the Federation, and the furtherance of disinterested inquiries. The federal and state civil service organizations have united with the National Research Council and the Institute for Government Research in promoting the Bureau of Public Personnel Administration. It is hoped that these personnel agencies may serve increasingly the industrial interests of the country or may lead industrialists to organize similar informational and research organizations to meet their special needs.

PROBLEMS OF SEX

A project known as a study of fundamental problems of sex is being promoted by the Division of Medical Sciences with the coöperation of the Divisions of Anthropology and Psychology, Biology and Agriculture. The Council has been able to secure funds especially for this work and is supporting in various laboratories the study of psychological and other aspects of

⁵ Information about the Personnel Research Federation may be obtained from the Secretary, Mr. Alfred D. Flinn, 29 West 39th St., New York City.

⁶ Information concerning this Bureau may be obtained through the Director of the Institute for Government Research, 26 Jackson Place, Washington, D. C.

⁷ The *Journal of Personnel Research* is published for the Personnel Research Federation by Williams & Wilkins, Baltimore, Md.

fundamental problems of sex. The results of such inquiry doubtless will ultimately find important relations to education, general and industrial hygiene, vocational selection and occupational placement.

It is not the expectation of the Research Council to continue indefinitely active participation in the organization and promotion of this project, but instead it will endeavor to effect satisfactory provision for the indefinite conduct of the work either through the establishment of a special institute, or other type of organization, or through the development of special research centers in existing institutions. This statement is meant to emphasize the initiatory and promotive rôle of the Research Council as contrasted with the operative.

STUDY OF VESTIBULAR FUNCTIONS

No better example of coöperative research in the science of psychology can be cited than the "study of vestibular functions." This work was undertaken by the Division of Anthropology and Psychology three years ago. Although seemingly a matter of "pure science," it has numerous and important practical relations, since the vestibular apparatus of the ear helps us to maintain equilibrium and orientation. Indeed, vestibular research, resulting in thoroughly reliable information concerning vestibular functions and providing convenient methods of testing them, is of vital importance to the art of aviation and to aeronautic engineering.

Although inadequate support has been available for this project, important results have been obtained in several laboratories. A few of the special activities and lines of inquiry may be mentioned: A historical survey of vestibular equilibration, with a complete bibliography of the vestibule; the de-

velopment of a clinical instrument for photographing the reflex vestibular deviations of the eyes of patients during rotation; study of habituation to rotation; thresholds of rotation; the adequacy of reflex compensatory eye-movements and the comparative physiology of the vestibule.

Coöperative study, by an associated group of individuals, of the complex and intimately related problems of vestibular function has proved especially valuable, and has once more demonstrated the importance of an organization or institution which can bring about the profitable association of individuals with related interests and in desirable ways further their research activities. In this particular case the Research Council has done little by comparison with what might have been achieved because it thus far has failed to secure special funds for the support of studies of vestibular functions.

PSYCHOLOGICAL RESEARCH PLANNED

The Division of Anthropology and Psychology has organized in the course of the past year an ambitious coöperative undertaking which is known as a study of scientific problems of human migration. This also is in charge of a special committee. The work already has commanded adequate financial support and, in addition to the preparation of research program and plans for the administration of inquiries, the Committee has been able to arrange for the organization and conduct of the following special psychological investigations. Mention of other than psychological research is omitted.

(1) Effort to internationalize or universalize methods of measuring important mental traits. It is hoped that this work may render possible increasingly satisfactory comparative study of human groups and individuals.

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(2) A study of fundamental or relatively primitive forms of human reaction, as, for example, reflexes and their conditioned manifestation in instinctive behavior, and the development of adequate methods of measuring or testing them. This investigation promises to yield new leads in the study of temperament, emotion, feeling and will.

(3) General analysis of human personality with effort tentatively to evaluate characteristics and to develop methods of measuring them. This difficult work is already in progress and it is hoped that it may speedily lead to the discovery and development of methods of measuring traits of temperament and character, comparable in practical serviceability with those now commonly used for the measurement of intellectual capacity and achievement.

(4) Analysis of mechanical abilities and the development of methods of measuring them. This methodological inquiry, of profound interest to business, is planned to supplement the projected studies of intelligence and temperament. It may destroy or it may support the popular superstition that those of scant intelligence are mechanically gifted.

Relations of the above inquiries to problems of human migration are not difficult to discover. Knowledge of human traits, differences, and their relations, is essential to the understanding of migrational phenomena and to wise regulation of the movements or relations of peoples. Such knowledge can be obtained only through the application of reliable methods of measuring human traits. It is the purpose of the Research Council to encourage the development of such methods.

Although this article is written wholly impersonally and mention of names is therefore avoided, it is essential to state that the success of the Re-

search Council depends entirely upon scientific investigators. Ordinarily the Council furthers investigations administratively and financially, while coöperating scientists actually conduct them.

SPECIAL CONFERENCES

An activity of the Research Council which has proved peculiarly useful is the organization of special conferences on timely topics. Among the subjects for which conference has been organized by the Division of Anthropology and Psychology are the following: Vestibular research; relations of psychology to medicine; personnel research; public personnel administration; problems of human migration; status of vocational guidance; pressing anthropological problems.

In almost every instance conference has resulted in action, and as a rule the outcome of action has been the organization of a committee or other group which devotes itself to the achievement through research of some practical or scientific objective.

FELLOWSHIPS AVAILABLE

Last to be mentioned, but far from least in importance, is the participation of the National Research Council in the establishment and conduct of fellowships for the confirmation of the interest of promising investigators. The Division of Anthropology and Psychology in coöperation with the Division of Biology and Agriculture recently effected the establishment of fellowships in biology, anthropology and psychology. This unique provision for the furtherance of research through the substantial encouragement of gifted investigators, following the completion of their academic professional training, has deep significance. It should command the enthusiastic approval and support alike of scientists and technologists, of those with aca-

demic interests and those whose principal concern is some practical bearing of results of research.

At this writing, National Research fellowships are available in chemistry, physics, the medical sciences, the biological sciences, anthropology and psychology. The Council has funds adequate for the support of more than one hundred fellows. The stipend voted depends primarily on the merits and needs of the applicant.

This brief and incomplete account of the psychological activities of the National Research Council indicates that they relate as intimately to business as to science. It is hoped that the organization may establish increasingly intimate coöperative relations with industry and effectively promote the solution of industrial problems while endeavoring also to further types of scientific research which lack immediate commercial significance.

Coöperative Business Research

By W. V. BINGHAM

AN experiment in the organization of research in business psychology has been in progress for seven years at Carnegie Institute of Technology. Here a serious attempt has been made to determine to what extent scientific method directed toward psychological problems of industry can be made to yield results of practical as well as theoretical import, and also to learn how far large business concerns will coöperate with an educational institution in the conduct and financial support of such psychological research. Although this experiment is far from complete, the time has come to review its progress and to report not only what successes have been credited to the methods here employed but also what difficulties have been encountered; for similar experiments are now going forward in many other educational and business centers.

Perhaps the latest instance of such coöperation between business and university is found at Johns Hopkins, where under the direction of Professor Knight Dunlap a three-year program of research is being inaugurated on the request of an association of Baltimore printing concerns and of the United Typothetae of America. For three years the Industrial Research Department at the Wharton School of the University of Pennsylvania—maintained in part by private funds and in part by coöperating industries—has been investigating personnel problems, although with an emphasis on economic rather than psychological aspects. The Harvard Bureau of Business Research has had business

coöperation in the assembling of instructional material—including problems in the psychology of advertising and selling—for use in the Graduate School of Business Administration.

In England the National Institute of Industrial Psychology was established in 1921 under the direction of Dr. C. S. Myers, with the support of business houses and of foundations but without university affiliations. The Tokyo Institute of Industrial Psychology, directed by Dr. Y. Uyeno, is supported by both governmental and private funds and has, I believe, some connection with the University. At the *Technische Hochschule*, in Berlin-Charlottenburg, Drs. Moede and Piorkowski are conducting active research in practical psychology, but I am unable to state to what extent they are financed by coöperating industries. Lipmann and Stern's *Institut für Angewandte Psychologie*, also with headquarters in Berlin, is independent of university control. In Switzerland, *L'Institut J. J. Rousseau*, founded by Professor Ed. Claparède and directed by M. Pierre Bovet, affiliated with the Psychological Laboratory of the University of Geneva, is now dedicated in part to industrial research. The Institute of Occupational Orientation in Barcelona is another relatively recent foundation for the promotion of investigations of occupational requirements. Coöperative research in business psychology has sprung up almost simultaneously in these widely separated centers, evidently because the need for it is world-wide, as is also the recognition that the tools of

psychological research have now been adapted to practical demands.

APPLIED PSYCHOLOGY AT CARNEGIE INSTITUTE OF TECHNOLOGY

I have been asked to tell what has been learned at Carnegie Institute of Technology regarding the feasibility of the scientific approach to problems of industrial personnel; and what can be said of the practicability of those types of research coöperation with business concerns which have here been put to the test.

Some picture of this organization is essential, but only the briefest outline will be given, because there has recently been published elsewhere a historical sketch of the origin and development of the Division of Applied Psychology at the Carnegie Institute of Technology and of its constituent coöperative research bureaus (1)¹.

The organization centered originally about the Department of Psychology and the Bureau of Mental Tests, whose duties of class instruction and of student examining were directed toward the needs of the undergraduates in this young vocational institution. Fully half of the 2,200 regular day students here are in training for careers in industrial and business management, social work, the teaching of manual arts, household arts, fine arts, or secretarial studies; or some other occupation in which success depends partly on ability to deal effectively with people. Most of these students have as a part of their instruction a brief introductory course in psychology. Many of them later take one or more specialized courses in educational psychology, selling and advertising, industrial personnel and management, and the like. The value of giving such students instruction in managing men

has long been recognized, but few are the educational institutions which have attacked the problem systematically. The need was brought home most forcibly in connection with an investigation made in 1920 in an effort to define the duties and qualifications of a manager in industry. Improved job analysis methods were utilized in a study of executives in printing industries (6), building construction concerns and machine production factories. With the coöperation of firms in Pittsburgh, Cleveland and New York, our representatives were permitted to list at first hand the duties and responsibilities of every executive from foreman to president. Many of the managerial qualifications were specialized, but there was one requirement which ran through practically all of the personnel specifications: the ability to manage men. It is not easy to say to what extent an engineering college may profitably attempt to develop this ability in its students, but since it is admittedly fundamental for the success of each graduate whose career leads him into a post of executive responsibility, the school may well do what it can to prepare its students for success in dealing with men. Carnegie Institute of Technology has, then, been interested in assembling teaching material of the sort which will make its undergraduate courses in psychology useful to its students. Research in business psychology has been encouraged as an aid to undergraduate instruction as well as to student selection and counsel (2).

DEMANDS ON PSYCHOLOGY FROM BUSINESS

Looked at from the opposite angle—that of the business world—the interest in promoting psychological research at Carnegie Institute of Technology is seen to have had several roots. It

¹ Note: Numbers in parentheses refer to titles listed at the end of this article.

grew originally out of the felt need for cutting down costs by increasing the reliability of selection from among applicants for employment. In 1916 the need for improved procedures seemed to be peculiarly acute in the sales field. Executives who knew how much it cost to find and train a successful salesman wanted to decrease if possible the percentage of failures. They knew that the cost of a mistake includes not only the expense of finding, employing and training a new salesman, but also the damage to sales and to good will inflicted by the man who did not make good. So it is not surprising that the first demand for personnel research on the evaluation of different types of scientific procedure in selection of employees, should come from sales managers and from executives of large manufacturing concerns whose primary responsibility was the marketing of the product. Later this interest spread. Office managers wanted help in evaluating the abilities and aptitudes of applicants for various types of clerical positions. Proprietors of large retail stores asked whether their methods of selecting department managers and other executives might not be improved. Factory owners raised similar questions regarding the adaptation of psychological procedures to their problems of personnel selection. Thus our initial research interest in the analysis and measurement of abilities contributing to success in selling widened to include the study of other occupations and careers.

The scope of our investigations had to be broadened also in other directions. The problem of personnel selection is an integral part of the whole problem of induction. To put the right man in the right place requires not only a correct initial choice; it involves training and supervision as well. More-

over, it frequently raises questions of organization and the distribution of responsibilities. It may lead into questions of remuneration and the relative importance of various incentives. The selection of the right applicants marks only the beginning of personnel administration.

While attacking problems of selection, placement, and supervision, the methods of research forced us to extend our studies in still another direction. We frequently found it extremely difficult to secure from the coöperating concerns dependable and adequate criteria of success. The relative achievements of fifty salesmen, for example, are not accurately measured by their amount of sales unless they have all been working in equally good territories. This made it necessary for us to turn to the economics of territorial analysis, methods of quota-setting and the like. Then, too, we could not be sure that "per cent of quota sold" was a usable criterion of success unless we had full and accurate information regarding length of service and other items in the personal history records of the salesman. This directed attention to questions of procedure in record-keeping. Always one of our major difficulties has centered in this uncertainty regarding the adequacy and worth of the criteria available for checking the validity of proposed methods. How is it possible to evaluate a psychological test or an interest-analysis formula or a personal history item, such as schooling or previous occupation or age at application, unless the investigator knows for a certainty that the salesmen reported by the coöperating concern as being superior or inferior in achievement are in reality superior or inferior? To any investigator planning an inquiry as to the value of intelligence tests, trade tests, aptitude tests, or other psycho-

logical methods, I always put first the question: Are you quite certain that the records you can get of actual achievement or value to the concern are dependable for use as criteria in testing the tests? Methods of research in business psychology are inextricably interwoven with methods of economic research, cost accounting and business record-keeping.

FOUR TYPES OF COÖPERATIVE RESEARCH ORGANIZATION

At Carnegie Institute of Technology the Division of Coöperative Research—formerly called the Division of Applied Psychology—has experimented with four different types of organization of research in coöperation with business concerns.

The first of these involves only an informal arrangement. When our problem has been one in which the results were of primary interest to our own faculty—as in the job analysis of the manager in the printing industry—the expense has been borne wholly by the institution and the coöperating concerns have given information freely for the general good of technical education. The only organization required has been the designation of a director of the research, who with his assistants has assembled and digested the information for the use of administrative officers and of the faculty committees immediately responsible for suggesting desirable changes in curriculum or methods of instruction.

We developed a second, more formal type of organization for the Bureau of Salesmanship Research, established in 1916 by twenty-seven coöperating firms of national scope, representing several types of industry. Steel companies and life insurance concerns united with manufacturers of office appliances, electrical equipment, linoleums, drugs, food products and

automobiles, in the support of this bureau. Each firm contributed an annual fee of \$500 (later \$1,000), and agreed to aid the investigations by putting into the common pool of information the results of its own experience in selecting and developing salesmen, and also by helping to carry out experiments in the evaluation of new selection methods. Carnegie Institute of Technology contributed office space, equipment and other overhead. This bureau was organized with a governing board representing the Institute and each of the coöperating concerns, with an executive committee of seven, and a research staff consisting of a director (full-time), an executive secretary (part-time), and a small corps of assistants and fellows (graduate students). It continued under the leadership of Dr. Walter Dill Scott until after the war, when the name was changed to the Bureau of Personnel Research and Dr. C. S. Yoakum assumed the directorship. As outgrowths of this bureau have been established from time to time other bureaus or special sections for research on the problems of a limited group of members.

One offspring of this parent bureau was the Research Bureau for Retail Training, established in 1917. It made possible an experiment with a third type of coöperative organization, for all of the supporting concerns were engaged in the same kind of business and were all located in Pittsburgh. Seven department stores joined in a contract with Carnegie Institute of Technology, agreeing to furnish for the support of the bureau \$32,000 a year for a five-year period. The apportionment of this expense among the co-operating stores corresponded roughly to the number of employees. Each store designated a member of the board of management, which also included

representatives of Carnegie Institute of Technology and of the Pittsburgh Board of Public Education. An executive committee of this board of management was responsible for carrying out policies and supervising expenditures. In conference with this committee we chose the director of the bureau, who in turn became responsible for his staff of research assistants. This type of organization has been well suited to the requirements of the situation. The coöperating concerns have kept in close touch with the progress of the work. They have supplied convenient opportunities for gathering research data and for training advanced students in store personnel practice. That the stores have found their investment a profitable one is shown by their request for a renewal of the contract for another five-year period. The progress of this bureau is attributable in part to Dr. J. B. Miner, who was primarily responsible for its organization, and to Dr. W. W. Charters, who for the past four years has been its director. In part its success is due to the similarity of the coöperating concerns, since all of them have much the same problems of selection and training of salespeople, service employees and minor store executives.²

The fourth type of coöperative arrangement we have used is the individual contract. In some respects this is similar to the contract with coöperating firms made by the Massachusetts Institute of Technology Department of Industrial Research and Coöperation. It also resembles the industrial fellowship plan which has had its fullest development at the Mellon Institute of Industrial Research in the field of industrial chemistry. As we have used this form of coöperative agreement it has ordinarily called for

payment on the part of the concern of a membership or consultation fee together with the privilege of making supplementary contracts for particular pieces of research or service at a cost to be agreed upon. The need for such a flexible arrangement arose because the firms constituting our clientèle have varied both in their needs and in their willingness to invest in research. One firm needed a survey of its clerical force of five hundred, involving job analyses and the determination of grades of responsibility for purposes of employee classification as an aid to salary readjustment. Another firm required a procedure of selection and a clearly outlined program of promotion. With another the problem of training was uppermost. Still others sought help in planning the installation of a comprehensive personnel system or in surveying the personnel administration already installed with a view to its improvement. Most frequently the demand has been for studies of sales organizations for the purpose of preparing improved procedures in selection, but even here the nature and size of the task varied so greatly from one concern to another that individual financial arrangements were indicated. Always it has been our purpose to undertake an investigation only if it gave opportunity for gathering new data of research value.

THIRD TYPE OF ORGANIZATION THE BEST

Our experience with these four different types of organization of coöperative business research has led us to the opinion that the most favorable conditions for substantial output are found in the third type of organization, the research bureau made up of a group of local concerns interested in the same problem and all willing to guarantee continued support of the

² This bureau has now been transferred to the University of Pittsburgh.

enterprise over a period of several years. This lends stability to the organization. It encourages concentration. It makes possible the initiation of investigations which may require some time before conclusive results are obtained. But we have not cared to abandon any of the other forms of cooperative organization because each meets a distinct need. Each serves to bring business and education into mutually helpful relations.

FUNCTIONS AND PERSONNEL OF COÖPERATIVE RESEARCH BUREAU

The dominant function of a cooperative bureau is, of course, research; but it should not be overlooked, when planning its organization, that provision must be made for additional functions. It is necessary not only to define sharply the research problem, to formulate methods of attack, to gather and analyze data, and to evaluate results; it is necessary also to keep in personal touch with the cooperating concerns, to maintain their active interest, to secure data from them, to study the modifying effects of local conditions in the firms, to interpret to them the research findings and to help in the process of practical utilization of results. We may speak of this as the coördinating function. Still a third function is that of instruction, since the research workers and assistants within the bureau itself are certain to need advanced specialized training.

It is not always possible to find a director for a bureau who can handle all three of these functions with equal facility. Usually it is better to specialize, to have one member of the staff primarily for the oversight of research, while another is chiefly responsible for outside contacts.

Frequently it is desirable also to assign to one member of the staff primary responsibility for editorial

work including the preparation of reports and bulletins to the cooperating members and manuscripts for the scientific journals.

Still another specialist who must be available for consultation, if not a full-time member of the staff, is the statistician. He should be in sufficiently close touch with the research problems to be able to give criticisms and suggestions regarding the choice of the more refined statistical procedures. And ordinarily it is necessary that he be ready to furnish some specialized instruction to the research workers in the use of these statistical procedures and in interpretation of findings.

A minor function for which provision must be made is supervision of the office, including oversight of the clerical workers and the keeping of records and accounts.

RESEARCH AND TEACHING

One question of organization has to do with the relation of research and teaching. An asset of the cooperative type of organization is close proximity to both business concern and classroom; and yet the bureau must not be a mere adjunct to a university department. The director of a bureau must be prepared to make this research his primary responsibility. If he undertakes to teach a regular schedule of university courses and supervise a cooperative research bureau at the same time, something is sure to suffer. On the other hand, the value of his research is enhanced if he has opportunity to do a certain amount of teaching, particularly of advanced courses germane to his research. This helps him to see his problems in their larger setting. His advanced courses and seminars serve also as the means of developing research assistants. But these teaching duties must not be onerous. One reason why not only

the director, but other members of the bureau staff should ordinarily have little teaching to do is that their hours must be flexible for consultation and field work. If all the coöperating concerns are located in the same city, this field work need not prevent the coordinator from carrying a certain instructional load. But if the coöperating concerns are scattered, it is necessary that the coördinator should be free to leave the city at any time. An ideal arrangement provides that certain members of the bureau staff shall have classes one semester and others the second semester. Whatever the details, it is important to conserve the primary advantages of the coöperative arrangement; namely, the research ideals, standards and atmosphere of a university coupled with the drive and reality of business.

DANGERS AND DIFFICULTIES OF COÖPERATIVE RESEARCH

Coöperative research has its own dangers and difficulties. To secure men who are competent to direct and supervise such undertakings—men of exacting standards and thorough scientific training with good business judgment and a capacity to meet industrial executives on their own ground—it is necessary to pay salaries somewhat higher than those sometimes prevailing in university circles. To do this may make for discontent on the part of other faculty members whose responsibilities are limited to the usual teaching requirements. On the other hand, funds supplied by coöperating firms sometimes enable the university to strengthen its faculty. It is also to be remembered that these salaries, although higher than the usual stipends of university professors, are lower than these same men would command in business positions or in private consulting practice. They are often will-

ing to accept as part of their remuneration the satisfactions of membership in the university, with a share in its social and educational activities and the opportunity to do the thing they most of all enjoy—scientific research.

Perhaps the greatest difficulty faced by a research bureau is the requirement of relative permanence and stability. Research men of major calibre are not going to devote themselves to difficult investigations unless they have ample assurance of the continuance of their work from year to year. Financial support from coöperating business concerns may vary with business conditions. This makes it essential that guarantees covering a period of years be assured, or that the educational institution be prepared to assume if necessary a fraction of the expense, thus providing for the maintenance of at least the nucleus of the business research staff. Without this assurance of stability and continuity, it is impossible to assemble a staff of high competence. The university should also, in my judgment, be prepared to make some financial contribution toward the support of the bureau because the coöperating concerns naturally tend to focus research activities in the direction of the immediately practical, whereas if the university is also a contributor of funds, it can the more readily insist on the ultimately greater value of a long-time research program with attention to fundamental theoretical considerations as well as to more immediate returns. The university also should have a certain proprietorship in such of the products of research as have value for class instruction. It should be prepared to invest some funds in reassembling and reworking for educational ends, and also for pure science, the materials gathered primarily for strictly business research. It is in this process of give-

and-take between classroom, research bureau and coöperating industry that there is generated in the university a vitality of instruction, and in business, an esteem for scholarship. For both of these ends, continuity and stability of organization are essential.

Stability of contact with the co-operating concern is also a desideratum. One of our firms has changed its sales manager or its vice-president in charge of distribution oftener than once a year on an average; and every change means that the nature and purposes of the whole program of coöperative research as related to that sales organization have to be sold over again. As a device for combating this difficulty of shifting personnel, we aim to have each coöperating concern designate a subordinate as well as a major executive who familiarizes himself with our problems and technique in so far as these are applicable to that concern. This subordinate may then take charge of assembling data, supervising record-keeping, introducing new aids and checking up on their reliability and worth. There is no question but that the value of the coöperative research arrangement to any one concern is heightened if it has a good man or woman in its employ who is competent to maintain these contacts and to do this work. Now and then we have been able to supply such a person specially trained in statistical and psychological technique, to meet the need of a coöperating concern wishing to add to its sales research or personnel office staff. More often it has been impossible to meet these requests and we have had to suggest that the concern send us some one of its own choosing for a year of training, or else be content with sending a representative to a two weeks' conference on bureau problems and methods.

Indeed it must not be forgotten that

a primary need of research in applied psychology is the training of a larger number of competent research workers. More than once the opportunity has presented itself to undertake some new problem, but we knew not where to find just the right person to assume responsibility for it—one who had the fundamental psychological training and research technique, coupled with the necessary familiarity with business and soundness of judgment in practical matters. And often when a business executive has asked for the nomination of a man competent to direct the work of a personnel research and planning department within his organization, we have had to admit that none was available.

It has been no easy matter to find enough high-grade advanced students for training in applied psychology and business research methods. This difficulty we charge partly to the youth of the institution and to our lack of strong allied graduate departments of economics, commerce and education. By means of scholarships and fellowship stipends we have, however, encouraged each year a few carefully chosen men and women to devote themselves to specialized training. They have here been introduced to business contacts while acquiring the fundamentals of practical research methods. Now, more than two score of our former graduate students, research assistants, and faculty members are filling executive or research positions in large business enterprises in strategic posts where a respect for facts and an acquaintance with research technique are valuable to the business organizations that have sought their services.

It has sometimes been momentarily discouraging to have our most promising young research workers enticed into business just as they were ap-

proaching the stage of sound and productive research output. And more than once we have seen our students leave for lucrative business openings before the discipline of their training here was complete. But we have always recognized that it is one of our functions to prepare men and women to go into business posts as well as into university positions. The future of research in business psychology calls for men of large responsibility in business who know psychology and research methods. From the standpoint of business, centers such as this should be fostered as trainers of men. Other agencies such as private consulting firms may offer excellent apprenticeships; but they cannot combine apprenticeship and fundamental theoretical training as do these business research bureaus that bridge the chasm between the academic and the practical.

Coöperative bureaus have sometimes found difficulty in preventing encroachments on research by other types of bureau activities whose value is appreciated by the members, such as making public addresses, arranging conferences and conventions, compiling current statistics which have only a momentary interest—what one of our colleagues has called “systematized gossip.” Bureaus initially established for research purposes have even shown a strong tendency to take on more and more of these service functions until the primary research objective was frustrated.

Another difficulty is the avoidance of superficiality. It is not easy for an investigator in business research to keep from yielding at times to the pressure for quick results. This pressure is perhaps keenest when the research is carried out under private business auspices; but there is no blinking the fact that it is sometimes felt even in coöperative organizations such

as we are here considering. It is a wise director who can plan his investigations so as to satisfy at the same time his executive committee and his scientific conscience. He makes a contribution to both business and science when he succeeds in persuading his board of managers of the real worth of patient, thorough, unspectacular, long-time, honest research on fundamentals.

ACHIEVEMENTS AND PROSPECTS OF COÖPERATIVE RESEARCH

It may not be out of place to speculate regarding the directions in which business research of a psychological nature will tend to proceed. There will without doubt continue to be demand for investigation of the nature and content of jobs; determination of levels of responsibility; analysis of conditions of work and of incentives and rewards; and the development of methods of measuring abilities and qualifications that make for business success. Some of these investigations will be general, but more will be specialized and limited to problems within a single vocation. We know, for example, all too little about requisites for success in salesmanship—and this after years of exploration. We do know that many of the qualifications that go to make a successful salesman are not universal, but vary with the general type of commodity to be sold and with the constituency (7). We know that intelligence as measured by typical mental alertness tests is significant even though it is relatively less important for salesmen of most commodities than are certain non-intellectual aspects of personality and character. We know now an enormous number of psychological tests which do not work in predicting relative success of retail salespeople. We do know the basic principles and the detailed procedures useful in developing in these

salespeople greater courtesy, interest and tact, as well as knowledge of the goods (3). We know the relative weight which should be attached to various personal history items in considering applicants for employment with certain sales concerns, and the technique is at hand for extending this information for any business with adequate records on a sufficient number of its salesmen (8). We know that in some sales organizations it is helpful to determine a lower critical score on the intelligence scale below which it is inadvisable to employ an applicant and also an upper critical score above which it is also unsafe to employ an applicant, apparently because if he is too bright he tends to become discontented and leave the concern for other employment before he has learned his job sufficiently well to be of value to the company. We know that an attempt to differentiate prospective sales engineers from other types of engineers was largely successful because the ordinary methods of evaluating personal history items, interview ratings, scholarship records, and psychological tests were supplemented by a simple but carefully prepared technique of interest analysis (5).

It is my prediction that in the next few years of research some of the results most valuable for business will be achieved through an extension and refinement of the methods here employed for sampling a person's interests, his likes and dislikes, his preferences, his fundamental drives (4). Research, then, will tend toward studies of non-intellectual traits, and we may expect here a development of methods of studying behavior even more valuable than those already at hand for the measurement of intelligence. It is safe to say that no amount of research will ever evolve a technique for predicting behavior or reading character

and personality with the facility and accuracy assumed by typical character analysts. But it is important that business men and psychologists cooperate in the development of truly scientific, sensible, practicable means of finding out with such reliability as is possible whatever of real significance can be learned about the measurement and valuation of traits of character and personality. Confusion in the public mind between scientific and pseudo-scientific methods in this field is a difficulty, but one that our bureaus have but lightly felt. A really sombre difficulty is the lack of adequate groundwork in social psychology on which to construct sound methods of measuring human differences in temperament and personality.

I have stressed in this paper the difficulties and discouragements of coöperative business research. The advantages are obvious. When a number of firms pool their available information and multiply sources of research data, they enhance the value of the returns while dividing the expense. Problems have thus been solved, the cost of which would have been prohibitive to a single concern. Moreover, when a coöperative bureau is established under suitable university auspices, the institution gives assurance that the work will be characterized by scientific disinterestedness, impartiality and thoroughness.

Research requires a degree of isolation, of patience, and of tenacity in pursuit of fact found more often in academic laboratories than in the rush of commercial offices. Busy executives, on the other hand, have facilities for supplying the facts about human behavior required by the investigator in business psychology. The coöperative research bureau dovetails these resources. Its success proves that business men are no longer hes-

itant to recognize the cash value of scientific method in psychology as well as in the physical sciences. This movement is indicative of a broad tendency for the university on the one hand and the world of practical affairs on the other to come into closer relationship for their mutual advantage.

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Psychology in the Service of the Life Insurance Business

By C. FREDERICK HANSEN

TWO clerks in the home office of a life insurance company recently were discussing the arrival of a psychologist to assist in the company's sales organization. "They don't need any psychology around here," said one of them, "to make things go right. All they need is a little knowledge of the workings of the human mind."

Without appreciating his own paradox, this clerk expressed the fundamental line of attack for introducing psychological science into the life insurance business—or into any other business, for that matter: placing emphasis on practical, individual matters which are to be handled, rather than focussing attention exclusively on the threads, in those matters, which have a psychological hue. Business results are the main object; the pursuit and enlargement of psychological knowledge is merely a by-product of business efforts.

This, at any rate, is the point of view of a number of trained psychologists who are now serving life insurance companies. Their technique, their field and their interests are bent in the direction of practical returns to the companies. They hitch up, without quibbling, economics, business statistics and other assistants as willingly as they use psychology, in order to turn a business furrow.

LIFE INSURANCE A GOOD FIELD FOR PSYCHOLOGICAL RESEARCH

The most "human" business in America, in many ways, is the life insurance business. It manufactures no product except ideas; its factories

consist of some intelligent men thinking about the best ways for people to provide against their future needs. The thoughts of these men are put in systematic shape—in policies and rate books—and are sent to men all over the country. These men, without tangible goods, but only with these ideas, go out and talk with other people about accepting them as a basis for their own plans.

In building up this "human" business, life insurance companies have been guided largely by two sciences—mathematics and medical science. Mathematics has furnished an analysis of the span of life under all kinds of circumstances, in the form of mortality tables, and has given the rates which must be charged for life insurance under all conditions. Medicine has sorted out the applicants for insurance and established the status of each.

Now, however, with its "product" scientifically developed, the crying need in the life insurance business is for scientific distribution of it to the people—the best selling of that product. Here psychology promises to take the rôle of guide to the business, for it is the "workings of the human mind," be that mind the customer's, the agent's or the supervisor's, that will have to be analyzed and studied. Only a real psychologist can answer questions like these: What kind of insurance, and how much, does Mr. Jones really want? How can he be led to want the insurance that he really needs? What sort of men will make the best agents? How can we discover men who fit that description? How can we build up a

life insurance expert out of a green candidate? What sort of man makes a successful agency manager? Where can we get men of that type? How can we reach out from our home office and stimulate the selling efforts of agents all over the country?

AIMS IN STUDYING INSURANCE

The life insurance business bristles with questions like these, and the student of human nature is wanted in answering them. Summing up the whole list of questions, it can be said that two great aims stand out in focusing psychology on the life insurance business:

First, to increase the range, the quantity and quality of life insurance sold and maintained, and

Second, to reduce the cost of carrying on the life insurance business.

By accomplishing these two aims, the most effective distribution would be secured—maximum volume at minimum cost, resulting in the highest profits to the companies.

From the point of view of the public, these aims are just as desirable. They can be restated as:

First, to get the most complete service in having the people's needs for life insurance filled;

Second, to get that service as cheap as possible.

For example, every year many thousands of men take up the job of being a life insurance agent, and "fizzle out." They are very costly to the company because they took the time of officers who recruited them, they used company materials, they interfered with company organization and they probably reduced the company's prestige and good will in their communities. These men were costly to the public as well, because they presented life insurance in a bungling sort of way, made mistakes and sold

insurance so poorly that people let it lapse. They represented an economic loss, in that a good plumber or farm hand became a poor distributor of insurance. Psychological research has taken up the problem of the best ways to select agents and this study promises to lead to much more effective distribution of life insurance in future years.

HOW PSYCHOLOGICAL WORK IN LIFE INSURANCE IS ORGANIZED

In grappling with these problems of a psychological nature, the life insurance companies have taken two steps: (1) They have established the Life Insurance Sales Research Bureau, a coöperative central organization maintained by sixty-four leading companies; and (2) they have individually employed trained men for their own activities of this sort. Only a few of the larger companies have adopted the second of these methods.

As a link between a growing science and a great business, the Life Insurance Sales Research Bureau occupies a unique position. It was originally established at Carnegie Institute of Technology in Pittsburgh, early in 1922, drawing its support from the agency officers' association of the companies, and securing many of its methods from the Bureau of Personnel Research. As this coöperative venture grew rapidly, it was moved to New York City at the beginning of 1923. The scope of the Bureau includes those activities which attach to the selling of life insurance, especially from the standpoint of the home office. In some cases, the Bureau simply transmits to its members the ideas and methods of the affiliated group, thus serving as a clearing house. In other cases, it conducts the most painstaking original research on agency problems. At a conference at New York last June, attended by sixty-two men from the

companies, the several lines of attack and the results secured were described in considerable detail.

The manager of the Bureau is John Marshall Holcombe, Jr., whose previous experience has included both sales research and life insurance administrative affairs. With him is associated a staff, including psychologists, statisticians and a commercial engineer. The psychological aspects of the work, therefore, are welded together with the other aspects which enter into each problem which is faced.

An outstanding example of organization for psychological study in the individual company is furnished by the Equitable of New York. Here there is a vice-president in charge of training the field forces, Dr. John A. Stevenson, who holds a Ph.D. degree in psychology; and associated with him are two psychologists conducting a sales research division. A quite different method of introducing psychological science into a company is followed by the Mutual Benefit, of Newark. In this company there is no "sales research" department, but Dr. Jay Ream, a trained psychologist, serves as an administrative officer in the agency department.

In general, the companies are finding a need for both collective study in a bureau and individual study in a company. The Bureau furnishes facts and a composite view, which no single company can get alone. On the other hand, the application of results depends largely upon having within the company a man who appreciates those results clearly and knows how to build company plans on them.

WHAT IS BEING STUDIED BY LIFE INSURANCE PSYCHOLOGISTS

Some of the main investigations under way by these organizations are the following:

(1) *A job analysis of managing a life insurance agency.* A strategic position in selling life insurance is held by the branch manager, for through his hands the company's service passes to the public and by him the agents' efforts are directed. Individual companies, as well as the Bureau, are analyzing down to its basic elements the work of a branch manager—what he does and how he does it—especially his functions in getting new agents, training them, dividing agency responsibilities, stimulating sales, etc. Out of these field surveys, by the synthesis of all the data, will be made clear the fundamental principles of successful agency management.

(2) *An analysis of successful and unsuccessful agents, so as to aid in selecting new agents.* This analysis is being made through the collection of full personal descriptions of all kinds of agents—complete data on their age, education, interests, dependents, previous occupation, etc., all compared with their sales records in the life insurance business. An intensive study of this character has just been completed by Dr. Grace Manson of the Bureau of Personnel Research, in collaboration with the Life Insurance Bureau, the results of which will soon be published. Further work on recruiting agents is under way and includes not only the study of men but the study of the various means by which they are attracted to the business.

(3) *A standardized survey of clerical positions in the home offices of life insurance companies.* The classifying of "human" data by psychologists in life insurance is further shown by the surveys of clerical employes in home offices. These surveys, under Dr. Marion A. Bills, seek to analyze the jobs of individuals, to classify them, and arrange for proper compensation

of the clerks in accordance with their various levels of difficulty, as well as determining the normal lines of promotion in work and pay.

(4) *An analysis of sales strategy, for use in increasing the effectiveness of the life insurance agent.* Branching out from the studies of salesmanship in general, several psychologists have, in the past three years, carried on special studies of the prospect who is approached by the agent and the proper *modus operandum* of the agent. Dr. E. K. Strong, Jr., in "The Psychology of Selling Life Insurance," Dr. John A. Stevenson in "Selling Life Insurance" and "Meeting Objections," and Mr. C. J. Rockwell in his manuals for students in life insurance schools, have especially carried over into the agent's job a knowledge of psychological principles. Mr. G. M. Lovelace has contributed further studies, orienting around an analysis of the prospect—what insurance he needs and how he can be led to realize his needs. A useful method of laying out these studies has been the "case method," in which the handling of actual cases is vividly presented. Work of this character has been carried

on chiefly in the schools for training agents.

CONCLUSION

The possibilities of psychological science as applied in life insurance companies are very great; only a beginning has been made. Perhaps the classical student will sometimes marvel at the broad and confident manner in which psychology is applied by his brethren in business. But at least the principles and the methods *are being used*, and from the crucible of actual use broader and firmer knowledge is certain to develop.

The limitations on advancement in this field are largely the limitations which have always encompassed psychology as a science. As one of the youngest sciences, psychology cannot be expected to put in as big a day's work in the business field as its older brothers, the physical sciences. Its muscles are growing stronger, however, with every task that is met and the alert business men who work in the life insurance field are laying on its shoulders daily a heavier job to perform.

Psychology in the Civil Service

By L. L. THURSTONE

IT is a matter of common observation that business transactions succeed and fail more often on account of their human elements than by their purely materialistic or economic merits. A sale is closed more often by the confidence of the buyer in the integrity of the seller, and by the other human elements in the relation of the two personalities, than by the strictly economic relation between the buyer's need for a thing and the cost of that thing. The same is true with regard to appointments to positions and promotions, and even to those transactions such as banking, which by their very nature might be expected to be determined largely by materialistic and financial considerations. In promoting a new enterprise the personalities of the men who are responsible for it seem to weigh far more heavily in deciding success or failure than the intrinsic economic or social merits of the case. No wonder, then, that business has turned its attention to the budding science of psychology with eagerness to use anything that claims to be organized knowledge in this elusive field.

BUSINESS MEN AND FAKE PSYCHOLOGY

The very fact that business depends more on its human elements than on its economic elements, combined with the fact that very little organized knowledge has been available about these human factors, has brought it about that business men are often willing to believe anything that calls itself psychology. It is remarkable that business men who, on account of their success, may be judged to be keen and critical, are often childishly gullible in accepting absolutely fraudulent serv-

ices which are well advertised under some psychological caption.

One of the best aids that can be given to business men is a criterion by which they may be able to judge the soundness of the psychological services that are being offered for sale. Men of affairs will not buy stocks and bonds simply because they are well advertised or because someone claims in his advertisements to be an expert, a doctor, who knows all about securities. These business men have their criteria in the form of sensible questions regarding the securities that they are buying. There is no reason why they should not also have a set of sensible questions regarding the psychological services that they are buying.

It should not be necessary to burden every business man or public official with the technical detail of psychological tests and other psychological procedures. Men do not attempt to be expert judges of all the professional services that they enjoy. They are content to leave technical detail in medicine, engineering, law, banking, and so on, to those who are qualified to serve these needs; and since psychological work is rapidly coming to the stage of development where it depends on a rather wide range of technical knowledge, it is reasonable to leave technical detail in this field also to those who are qualified by training to serve. But right here it is that a strange inconsistency appears. These men of business are extremely critical in selecting bankers and engineers and lawyers and accountants for professional services, but they become as gullible as children when a fake psychologist appears on the scene. He calls himself

a doctor and uses more or less crude advertising methods; he hires a hall and charges handsome fees for telling in ten lessons the psychological tricks of success. Experienced men of affairs swallow the stuff whole and the fake psychologist leaves town with a fat purse. This state of affairs in applied psychology is possible because business men do not have any standard or criterion by which to judge the psychological stuff that is being offered for sale, and they have no standard or criterion for judging the qualifications of the would-be psychologists.

It would be a hazardous undertaking to lay down with a feeling of finality a set of rules for judging the soundness of psychological services and of psychological training. It would be a difficult undertaking even in the fields of work which have been developed much farther than that of applied psychology. It is possible, however, to state the basic criterion which a reputable psychologist would use in judging the merits of a psychological service, and there is no reason why it should not also be available for use by men of business. This fundamental criterion concerns the experimental methods by which any new procedure has established its merits.

HOW TO JUDGE A PSYCHOLOGIST

The first inquiry to make is, of course, about the man who offers his services or his system or instruction or book. Who is he? What is his training, not in law or medicine or engineering, but in psychology? Is he a member of the American Psychological Association? Is he acknowledged by the Psychological Corporation as competent to do the kind of work that he offers for sale? At what university did he receive his training in psychology? Does he hold any college degrees in psychology? The man who prides

himself on being intensely practical occasionally sneers at the idea of using a college degree as evidence of competency. But he does use such a standard for the physician that he consults, the dentist, the lawyer, the engineer. Why not use the same kind of standard for the psychologist whose services he proposes to buy? It does not follow that every man who has a college degree is a competent physician or dentist or engineer. But it is true that practically all physicians and dentists and engineers who are competent hold college degrees in their own line. Make the same request of the psychologist. These preliminary inquiries would eliminate most of the fake psychologists who thrust themselves on business men.

EXPERIMENTAL TESTS OF PERSONNEL METHODS

The best standard is that of scientific experiment. It is possible to carry out controlled experiments in the field of applied psychology just as in other fields of applied science. If it is proposed to install a new brand of tires on the trucks of a large department store it would be reasonable for the manager to carry out a little experiment with the control that is characteristic of scientific work. He would install the new tires on one or two trucks and he would keep a careful record of mileage and wear. He would compare this record with the similar records of the tires that he is now using and calculate the cost per mile of truck transportation. He would then have the impartial facts on which to base his decision and he would be relatively independent of the personality of the new tire salesman. Why not apply the same logical procedure to psychological methods in personnel? If someone offers for sale a method of selecting salesmen by the shapes of their heads and faces it would be

reasonable for the manager to carry out an experiment, but that is seldom done. No reputable psychologist attempts to sell such service because there is no honest scientific evidence in support of any of the so-called systems of character analysis. The scientific work that is cited by the character analysts as support for their methods is a distortion and a fraud. But there is still a chance that there is some truth in some of these methods. The important fact is that, so far, no experiments have ever been reported in any scientific journal to verify whatever truth there may be in any of the systems. The scientific work so far done in this field has turned out negative for the systems of character analysis, but the experiments have not been carried far enough to be conclusive.

Before adopting any system of selecting salesmen, the manager ought to carry out an impartial experiment at least as elaborate as the study of the tire records. Select thirty salesmen for the experiment, ten of the best, ten of the average, and ten of the poorest in the firm. Bring them in to the character analyst, one at a time, and specify that there be no conversation between the character analyst and the salesman in order to limit the experiment to the shape of the head and face. Let the character analyst give a definite rating of selling ability by arranging the names or code numbers of the men in three or four groups from the best to the poorest. Do not allow the character analyst to seek cover under a lot of general phrases. Insist that the ratings be given before the analyst leaves the premises as an additional control of the experiment. Then place his list of definite ratings next to your own ratings of the known selling abilities of the men and make a comparison. As an additional check it might be well to ask some sales manager or employment

manager to interview the same salesmen without knowing their records. Then there would be three records to compare, namely, one list of ratings for the actual selling ability which is the standard of comparison, one list of ratings made by a sensible man who does not claim to be a character analyst, and one list of ratings made by a character analyst. Now, if the ratings of the character analyst agree better with the actual selling records of the men than the ratings of the regular employment interviewer, then the character analyst has made a legitimate demonstration of his skill. Before the experiment reaches this stage the character analyst will probably slide off with some explanation about the unfairness of the conditions.

The subject of psychological tests in employment is being studied by experimental methods. For example, let us assume that it is proposed to use a clerical test in order to select applicants for clerical positions. Before the test can be legitimately adopted it is necessary to give the test to people whose proficiency as clerks is known, and to compare the test records with the known proficiency of the clerks. If the two lists agree fairly well the test is accordingly fairly good. If the two lists of ratings do not agree the test is not suitable. The logic of experimental procedure is the main message that reputable psychologists can give to business. Such experimental work is being carried on in the civil service and is suggestive for private business.

PSYCHOLOGY IN THE CIVIL SERVICE

The civil service commissions are primarily interested in examinations and other methods of appointing applicants for positions in the public service. The scope of their work sometimes extends farther than the selection of applicants, but most of their work is at

present confined to this phase of personnel work. During my short association with civil service commissions I have come to have a very high regard for the character of their work. I have found that the examinations that are conducted by the best commissions are of a very effective kind and that most of the commissions are eager to carry on experiments to ascertain the best examination technique. I am sure that the civil service examinations are on the whole far superior to the employment methods that are used in private industry. Even the most comprehensive employment tests that I have seen in private industry are not superior to the examinations that are being used by the best civil service commissions. There are few private firms that employ clerical help by methods as thoroughly studied in detail as those that are being used by the larger civil service commissions. For this reason I believe that private industry could profitably study and copy the civil service employment methods.

The civil service commissions are giving serious thought to the possibility of applying psychological examination methods more extensively in the field of public employment. They are interested not only in the intelligence tests as a supplement to the more definite requirements for each position, but they are also studying the short-answer test methods that have been developed largely by psychologists. There are two distinct contributions that psychologists can make at the present time to civil service technique and which will be welcomed by most of the commissions. One of these is the experimental study of intelligence tests in the civil service. It has already been found that intelligence tests are useful in selecting office clerks in the civil service, and the United States Civil Service Commission, for some time, has used

an intelligence test for selecting general office clerks. The actual test marks have been compared with the known proficiency of the clerks and it has been found that the agreement is closer than between the older civil service examinations and the known proficiency estimates. Not only have the intelligence tests shown themselves to be an improvement in making the examinations more effective for selecting the qualified applicants, but the intelligence test methods have also been found to afford a very substantial saving in the expense of marking the papers. This is brought about by the short-answer form which is remarkably economical when large groups of applicants are to be examined. These new psychological examination methods have been adopted for clerical tests by several of the best commissions including those of San Francisco, Minneapolis, Boston and others. It still remains for further experimentation to determine to what extent the intelligence tests can be useful as a part of the tests for other types of positions in the civil service.

Another line in which the psychologist can make a contribution to civil service procedure is in the study of the short-answer form of test in those examinations in which knowledge of some subject matter is a requisite. It has been found, wherever experiments have been made, that the short-answer type of test makes it possible to cover a much wider range of knowledge in a given examination time than the older so-called essay, or free-answer, form of tests. The San Francisco Civil Service Commission has adopted the short-answer type of test for most of its examinations.

These contributions are rather specific and they refer exclusively to examination technique. There are other civil service problems in training, promotion, maintenance of an effective

corporate spirit, efficiency in government work, examinations to determine temperament and administrative ability of applicants, tests for measuring honesty, and many others which psychology will have an opportunity to assist in solving whenever it has anything worth while to offer. So far, the most conspicuous contributions of psychology have been in the field of examination technique and these have been very considerable and well received.

THE BUREAU OF PUBLIC PERSONNEL ADMINISTRATION

The Bureau of Public Personnel Administration was established October 1, 1922, as the result of a movement originating at the meeting of the Assembly of Civil Service Commissions held at Rochester in 1919. Exchanges of experiences at meetings of civil service administrators and others had developed the fact that civil service commissions, acting independently, often attacked *de novo* some problem worked out successfully in other jurisdictions, that no individual commission had any adequate facilities for finding out what other commissions were doing, and that a vast improvement in civil service administration might be expected to result if the best practices developed independently by the commissions with facilities for study and experiment were put into effect generally. It was recognized, however, that if an organization were established it should not merely assemble and disseminate information regarding current civil service practice, but should also make studies for the purpose of improving existing methods, particularly of testing applicants for positions in the public service.

Before the Bureau of Public Personnel Administration was finally established, its purposes, by common con-

sent of those interested, were formulated as follows:

1. To serve as a clearing house for existing information relating to personnel administration in the public service, national, state, county, and local.

2. To develop and improve methods of personnel administration through the conduct of original investigations and experiments.

3. To publish the results of its work in such form as experience may demonstrate to be most effective for the improvement of the personnel administration of the public service.

The Bureau of Public Personnel Administration is administered by the Institute for Government Research with the advice and cooperation of an Advisory Board representing the various groups most interested in public personnel administration. The membership of the Advisory Board includes two members representative of the Assembly of Civil Service Commissions, one of the United States Civil Service Commission, one of the National Civil Service Reform League and one of the National Research Council. The Director of the Institute for Government Research also serves as Director of the Bureau. The offices of the Bureau are in the quarters of the Institute at 26 Jackson Place, Washington, D. C.

Both the Bureau and the Institute are privately, though separately, supported. A private citizen interested in civic progress has contributed to the Bureau \$25,000 a year for a period of three years with no conditions as to its expenditure except that it be used in the study and solution of public personnel problems under the form of organization described above. Neither the Bureau nor the Institute has any official connection with any federal, state, county, municipal, or other government body.

Among the proposed and current projects of the Bureau are the following: Compilation of civil service laws and practice, the classification of positions in the public service, tests and training courses for patrolmen and firemen, tests for skilled trade positions, clerical tests, tests for stenographers and typists, tests for library positions, the application of intelligence tests to civil service needs, objective examination methods and the short-answer methods. The Bureau has in preparation a series of bulletins summarizing its studies. These bulletins will be called "Public Personnel Studies" and they will be issued as rapidly as the Bureau studies become available for distribution.

The main psychological contribution of the Bureau is probably in assisting civil service commissions to adopt the scientific or experimental methods in studying personnel problems. Instead of writing an examination for patrolmen, for example, on the basis of informal experience, the attempt is now being made to compare the scores that applicants attain in different kinds of examinations with the estimates of the police departments about the proficiency of those who are appointed as patrolmen. In this way experimental

evidence will be accumulating by which a quantitative evaluation may be made of the different types of examination for a particular type of position. As a result of such work it will be possible to recommend certain types of examinations as superior in discriminating value, and the recommendations will be based on an impartial study of the experimental facts instead of on somebody's personal opinion. Several such studies are at present being carried out.

The value of an examination cannot be settled finally by merely talking about it. Problems in physics and chemistry are not settled by discussion. Neither can problems in personnel be settled by mere talk and opinion. The main object of the new Bureau is to contribute something toward the solution of public personnel problems by the experimental or scientific methods. This contribution can be made best at the present time on the examination problems because they are rather specific and the scientific methods are already available. When the technique of the social sciences has developed farther, it will be possible also to use an experimental attack in solving problems of organization and leadership which are still being met by rough conjectural methods.

The Function of Psychology in the School of Business Administration

By KARL G. MILLER

THE basic aim of education is so to equip the youth that he may solve with a greater degree of success the problems which he will encounter in life. As the world adds to its store of knowledge, acquired through arduous and painstaking endeavor, this information is passed on, through the process of education, for the benefit of those who are to follow. A generation ago, the underlying principles of commerce and finance could be apprehended only as the result of a long and difficult apprenticeship in the business world. Today the school of business administration provides the youth at the outset of his career with a wealth of scientific knowledge regarding the theory and practice of commerce. It is no longer necessary for each individual to seek out for himself the problems of supply and demand, the principles of accounting and advertising, the practices of banking and brokerage. And yet, although business is essentially a process involving human relations and reactions, there are many business schools which have not yet included the fundamental science of human behavior as a part of the curriculum.

Popularly it is still thought that psychology is a branch of mental philosophy, requiring no other equipment than a comfortable arm-chair and a desire to cerebrate indefinitely over abstruse and impractical problems. On the contrary, the psychology of today has its well-equipped laboratories and machine-shops, its complicated apparatus and delicate instruments, its well-established methods and standards. Psychology is no longer chiefly con-

cerned with a subjective reflection on conscious processes. The mind is too elusive and intangible a subject for scientific examination. But human actions and reactions can be observed and measured and compared. Psychology today is interested not so much in what the individual thinks as in what he does. It concerns itself with human activity of every kind—from the reflex winking of the eye to the skilled performance of the aviator, from the simple cry of the babe to the complex behavior involved in selling wild-cat oil stock to a canny Scot. Psychology analyzes human reactions from every angle, it studies the mechanism and the motives which underlie human conduct, it investigates the relative rôles of heredity and experience, the part played by instinct and by habit. And on the basis of the present performances of an individual or a group, psychology has developed methods for predicting future behavior. Contrary to the more generally accepted doctrines of human behavior, psychology formulates principles only when they can be based upon scientifically demonstrable facts.

PSYCHOLOGICAL ASSUMPTIONS IN ECONOMIC THEORIES

Even though only a few of the more progressive schools of business administration have included psychology as a regular subject in the curriculum, it is by no means overlooked in the classroom. Writers and lecturers in economics have come to recognize that man is never solely an economic man. Human desires and aversions, instincts

and emotions, must be written into the equation of supply and demand. The economist today is talking psychology to a student body which knows nothing of the basic principles of the subject. The same situation is true with regard to sociology and political science. Experts in these fields recognize that it is impossible to understand man in his complex social and political relationships without the underlying knowledge of man as an individual. And so the lecturer in sociology and the lecturer in political science preach psychology to the bewildered undergraduate,—and sometimes it is a very unscientific brand of psychology. It would therefore seem advisable, on both logical and practical grounds, to include psychology in the business curriculum.

However, there is another group of subjects, usually included in the course of study, to which a knowledge of the fundamental principles of psychology is even more indispensable. Salesmanship, advertising, personnel work in its phases of selection and job analysis, these are essentially applied psychology and in the text-books and courses in these subjects frequent reference is made to the psychological factors involved. It is the course of events, then, that the student graduates from the school of business administration with some knowledge of the psychological aspects of economics, sociology, and political science, and with various psychological formulae to be applied in merchandising and management, but with no organized or crystallized ideas as to psychology itself. The present situation in many of our foremost business schools is quite analogous to a medical education which includes only a study of the particular dosage for each type of disease, without wasting time on the fundamental studies of anatomy and physiology. No one

would care to be treated by a graduate of such a school.

PSYCHOLOGY AS THE SCIENCE OF HUMAN BEHAVIOR

It is not intended to give the impression that psychology should be included in the business curriculum merely as an adjunct to the courses already taught. Psychology, as the science of human behavior, has developed a technique and amassed a fund of knowledge which richly merits inclusion in the course of study in its own right. It may be stated that every science has a two-fold function. Its first duty is to classify the various phenomena which comprise its field of investigation, and descriptive psychology can now present a satisfactory classification of the various types of human behavior and of the mental processes which are at the basis of such behavior. But science has a second and more important function, it must explain as well as classify, it must be dynamic as well as descriptive. It is the comparatively recent developments in dynamic psychology which are of primary interest to the business man. The psychologist of today works much after the fashion of the analytic chemist, who examines some complex substance with various kinds of reagents in order to determine the kind and relative amount of the different elements which compose it. The chemist is then able to predict the manner in which the complex substance will react to different types of stimulation. Although it is not claimed that psychology has attained the accuracy of chemical analysis, remarkable advances in the prediction of human behavior have unquestionably been made. Kingsbury¹ has shown in a recent article

¹ Forrest A. Kingsbury, "Business Judgment and the Business Curriculum," *Journal of Political Economy*, June, 1922.

that such a seemingly indefinable thing as *business judgment* is subject to psychological analysis, and is the function of certain innate characteristics acted upon by environmental factors of training and experience. The first step in applied psychology, then, has been to analyze human competency into its component abilities, both inherited and acquired, and then to develop a battery of mental tests for the purpose of measuring the relative importance of these abilities in the individual make-up. In other words, human behavior is elicited under standard and carefully controlled conditions of stimulation which are so designed as to call into play only certain definitely determined mental processes.

In answer to the objection that the procedure outlined above is ideal and visionary in character and not susceptible of practical application, it is only necessary to refer to some of the outstanding illustrations of the application of scientific principles in the prediction of human behavior. No one today questions the value of the army psychological tests which so efficiently stratified an unclassified mass of almost two million men. Millions of dollars were saved and untold confusion avoided by eliminating at the outset those so mentally inferior as to be unable to respond to military training. Contrasted with the army tests are the psychological entrance examinations which have supplanted the content examinations in a number of our leading universities. Here the purpose is to select those of superior intelligence from an already highly selected group. The use of selective tests in many leading industries, and the examination of suspected mental defectives in juvenile courts and psychological clinics, provide other important illustrations of the prediction of human behavior through the analysis

and measurement of various human abilities.

It must not be supposed that psychology is primarily a science of individual examination and testing, although this is one of its most important phases in its industrial application. Much of value can be learned through the examination of the group rather than the individual. The kinds and relative importance of human instincts, the laws of habit formation and interference, the characteristics of memory and the learning process, the relative attraction of various types of external stimulation, these merely typify a great group of psychological principles which are of the utmost importance in the prediction of human behavior and which can be arrived at by a scientific experimental procedure.

LEARNING TO UNDERSTAND ONESELF

In addition to training the student to evaluate the competency and predict the behavior of his fellows, the course in psychology may serve another and perhaps equally important function. While analyzing the behavior of the other man, the student necessarily learns something of the mechanism and motives which underlie his own behavior. While learning to evaluate the abilities of the other man, the student cannot but learn something of his own resources. While learning how to select the right man for a particular job, the student may discover the particular job for which he himself is best equipped. The program in psychology herein proposed will then have two essential aims: first, to enable the student to predict more accurately the behavior of those with whom he comes into contact, and second, to enable the student better to understand himself. If a course in psychology can accomplish either of these ends to any appre-

chable degree, it need hardly be stated that such a course would be invaluable to one whose success in life will be measured by his understanding of human relations and his ability to anticipate human reactions.

In addition to its primary purpose of training the embryo business man better to understand and predict behavior, the psychology course may serve another equally practical function. Dickinson,² in discussing the rôle of psychology in business education, says, "It seems possible that even the modicum of psychology which our sophomore learns in this elementary course will make him a harder prospect for purveyors of spiritism, phrenology, will-power, and even psychoanalysis!" When one considers the number and cleverness of the horde of charlatans who, under the disguise of psychology, are besetting the pathway of the unsuspecting business man with a thousand and one panaceas for every variety of industrial problem, it would seem that a course in psychology would justify itself merely as insurance against pseudopsychological fraud. Any disrepute which may have attached to the industrial applications of psychology in recent years may largely be accounted for in the too ready acceptance by business of nostrums prescribed by persons using the title "Psychologist" without any justification.

In concluding any argument as to the advisability of including psychology in the curriculum of business education, one additional advantage must be noted. In most of the courses of study as at present constituted, the subjects of instruction may be divided into three general groups. First, and from the point of view of the student most important, are the courses of a

distinctly practical character, such as accounting, insurance, selling, advertising and the like. These are subjects which have an immediate application in the field of business. The second group, comprising economics, sociology and political science, are more theoretical in character but have an unquestioned ultimate application. Finally, there is a third group of subjects, including English and foreign languages, history, mathematics and the physical sciences, whose purpose may be described as primarily cultural and "disciplinary." Two quite opposite, but not in the least contradictory, tendencies may be noted in business education at the present time. In one direction is the effort to make the subjects of immediate application more practical, definite and reliable. In the other direction is the tendency to include in the course of study more subjects of a cultural nature, and more particularly to require training in at least one science providing the discipline of laboratory technique. In the light of the preceding discussion, the statement seems justified that psychology possesses, in a degree which no other subject in the catalogue can boast, the essential features of each of the three types of courses included in the business curriculum. It has a laboratory technique which compares favorably in disciplinary value with any of the so-called exact sciences, and which may also find immediate application in the problems of merchandising and personnel. At the same time it has an ultimate application in the understanding of human behavior and in its relation to the other social sciences that has already been discussed.

ORGANIZATION OF PSYCHOLOGICAL COURSES

If it be granted that psychology merits a place in the curriculum of the

² Z. Clark Dickinson, "The Psychology Course in Business Education," *The Journal of Political Economy*, February, 1922.

school of business administration, certain questions of a more practical nature immediately arise. At what point in the course of study should psychology be introduced? What is the minimum number of hours which should be allotted? What subject matter should be included?

Briefly, the ideal program would include a required course calling for two lecture periods and a two hour laboratory period per week throughout the sophomore year. Following the principle, previously suggested, of not attempting to teach the practical formulae before establishing the fundamental principles, this required course should be general and basic in character, choosing its illustrative material from the realms of commerce and industry. Both Kingsbury and Dickinson, in the articles already mentioned, agree that this first course should be general, that is, of ultimate rather than immediate application. However, more advanced elective courses in the various fields of applied and industrial psychology would supplement the introductory course and offer opportunity for the development of method and technique. The required course is placed in the sophomore year so as to articulate as closely as possible with its complementary sciences of economics, sociology and political science, and so as to permit the course to be made prerequisite to the practical courses in merchandising and management.

Although essentially in accord with the suggested courses outlined by Dickinson and (in greater detail) by Richardson-Robinson, Kingsbury, and Robinson,³ the present writer is forced to decry their omission of laboratory

work from the elementary course.⁴ Although there may be serious obstacles in providing laboratory space and sufficient staff for handling large numbers of students, the writer is convinced that psychology can be taught effectively only in laboratory sections limited to thirty or thirty-five students each. This method of instruction may be supplemented, but not replaced, by lecture work with much larger sections. During the last academic year more than eight hundred students in systematic courses were instructed by the laboratory method at the University of Pennsylvania. The reason for this insistence on laboratory instruction is clear. The purpose of an elementary course in psychology is not primarily to impart a mass of facts, but rather to instill in the student a new attitude, a different method of approach. The ability to predict human behavior can be learned neither from text-books nor lecture notes; it can be acquired only as a result of practice and training in the observation and analysis of behavior. When the lecture method is supplemented by laboratory work, the student not only acquires a new and important system of facts, but he also becomes, in some degree at least, a psychologist.

CONTENT OF THE INTRODUCTORY COURSE

In discussing the content of the proposed course in general psychology, it seems hardly profitable to go into great detail as to the material to be presented. The subject matter will undoubtedly vary with the training and peculiar interests of the lecturer and with the equipment of the laboratory.

³ F. Richardson-Robinson, F. A. Kingsbury, and E. S. Robinson, "A Program for Psychology in a College of Commerce and Administration," *The Journal of Political Economy*, February, 1922.

⁴ One of the questions now at issue among psychologists themselves is the feasibility and desirability of experimental work in the introductory course and one of the factors determining this is the amount of time available. — Editors.

It is possible, however, to indicate certain general principles of the science which should be included in the course. Without entering into the ever-interesting warfare between the introspective and behavioristic schools of psychology, the categorical statement may be made that no elementary course in psychology can be complete unless it deals with consciousness as well as behavior. At the present stage in the development of the science, the observation of behavior is significant only in so far as it enables the observer to infer the presence of mental processes and mental abilities. The basic course will, therefore, naturally divide into two fairly distinct parts, the work of the first semester being chiefly concerned with a study of consciousness, while the second term treats of behavior.⁵

The introductory lectures of the course will naturally deal with the nature of psychology, its field and method. The difference between reaction and behavior should be established immediately, showing that behavior implies certain abilities in the subject and cannot be explained solely in terms of cause and effect. The transition to a systematic study of consciousness can be made without difficulty. Starting with an analysis of sensation, the processes of apperception, perception, perseveration, memory, imagination and reasoning will be discussed. Emphasis should be placed on the learning process, imaginal types, constructive imagination and attention. The laboratory work of the first semester will be chiefly concerned with a series of mental tests,

designed to illustrate the mental processes and abilities discussed in the lecture course. Such tests as the memory span, distribution of attention, observation, memory, sentence completion and opposites may be employed. The group results in each case will give the individual the opportunity to rate himself against his group or other standards. These results also provide the basis for an introduction to statistical treatment. The distinction between tests of specific abilities and of general intelligence should be made, the technique of test formulation explained and some indication of the procedure in job specification and vocational guidance given. It should be kept in mind, however, that the purpose of the laboratory work is primarily to inculcate the psychological attitude, and not to develop technicians who are capable of making immediate practical applications in the field of differential psychology.

The lectures of the second term may well be introduced with a series of striking illustrations of the different modalities of behavior. The mechanistic attitude may be developed by a discussion of the tropisms of unicellular organisms and a brief survey of comparative psychology. Reflex action naturally leads to a description of the human nervous system, with particular emphasis on its sensory and motor aspects and the associative function of the brain. A criticism of phrenology and its physiognomical offspring prepares the way for a discussion of localized functions of the cerebral cortex. Having established this physiological basis for behavior, a discussion of instinct naturally follows, with special emphasis on instincts in industry and the relation of emotion to instinct. The various types of behavior due to suggestion lead to a treatment of volition

⁵ Most instructors who attempt to do justice to both viewpoints in psychology prefer to present the viewpoints simultaneously rather than make such a division of the course as here indicated. Here again the question of the length of time available for this course is a consideration. — Editors.

with a contrast of the vitalistic and mechanistic explanations. Finally, the discussion of habit provides opportunity for some excellent industrial illustrations. During the course every effort should be made to establish the viewpoint that human behavior is the function of definite and analyzable factors and that ability to predict behavior depends upon the accurate analysis and evaluation of these factors.

The laboratory work of the second term should include some very practical experiments dealing with various aspects of behavior. Hales' experiment with the decapitated frog, observation of the behavior of unicellular organisms, practical work with the ergograph accompanied by a discussion of fatigue in industry, demonstrations with the plethysmograph showing vasomotor changes accompanying different mental states, card-sorting to illustrate the formation and interference of habit,—these are only suggested exercises which might be included in a laboratory course in behavior. Every opportunity should be taken to examine children before the class with the aid of performance tests, and it is highly desirable to illustrate the procedure of vocational guidance with actual examinations. The practical application of differential psychology becomes vastly more meaningful to the college class, when it is allowed to assist in the solutions of a bona fide human problem.

ADVANCED COURSES IN PSYCHOLOGY

In considering the more advanced courses in applied psychology, to which

the course suggested above will be prerequisite, certain principles may be stated. These courses in the psychology of selling, advertising and personnel work should be designed for immediate rather than ultimate application. While the theoretical aspects of the various fields should be considered, emphasis should be placed on field work and experimental procedure. In other words, these courses should be of a technical character and should, therefore, be under the supervision of men who have not only a thorough training in psychology but also a wealth of practical experience in their respective fields. The advanced courses which can be offered will be definitely limited by the practical experience of the faculty in psychology.

The writer will not presume to outline the content or procedure in these advanced courses. However, a very suggestive syllabus, which might well serve as a basis for a group of advanced courses, is to be found in the article by Richardson-Robinson, Kingsbury, and Robinson³ previously mentioned.

In conclusion, it seems safe to prophesy that within the next decade psychology will have taken its rightful place as a fundamental subject of the business curriculum. Experience has shown that the undergraduate is intensely interested in such a general course as that described above and it has been necessary to limit the number of registrations because of lack of adequate facilities. And, say what you will, the undergraduate in the school of business administration is a fairly competent judge of the applicability of the courses to which he is exposed.

Psychology in Business—in England, France and Germany

By MORRIS S. VITELES

IT was from Europe, from the halls of the University of Leipzig and the mind of Wilhelm Wundt, that the United States received the first impulse to take up experimental psychology. That impulse found sympathetically vibrating receivers in this country and resulted in the development of an experimental technique, laboratories and equipment which are the equal, and in many cases the superior of those in Europe. But that impulse was also transformed and extended, and has been returned to Europe in the form of a stimulation to the application of psychology in business.

Psychologists in Europe, it is true, had earlier given thought to the possibilities of such an application. Pierre Janet, the noted French psychologist, in his book on "Obsessions and Psychasthenia," drew attention to the importance, in avoiding mental disorder, of placing men in jobs for which they are fitted. The problem of misplacement in industry had also been considered by Dr. Wetekamp, of Germany. In addition Lahy, of Paris, had experimented in the selection of stenographers as early as 1905, but it was Hugo Munsterberg, of the Psychological Laboratory of Harvard who, in 1912, first formulated clearly and fully the problems and program of an industrial psychology and suggested the experimental technique for the new application of this science. The influence of the opinions and the work of Munsterberg in the application of psychology in business in Europe today cannot be overestimated.

The impulse toward this new appli-

cation of psychology originated with Munsterberg of Harvard, but in Europe, as well as in America, the war stimulated its growth. In all of the major countries involved in the war the psychologist was called upon to render service in the proper classification of army personnel and in the selection of men for service requiring special ability. In England, Germany, France and Italy, as well as in America, aviators, observers, "listeners-in" on submarine detectors and others detailed for special service were selected by means of psychological methods. The success of these methods contributed to the further development of the application of these methods in industry after the war. It is impossible, however, to give an account of these army applications of psychology and the post-war application in the vocational rehabilitation of disabled soldiers within the narrow limits of a short article.

EUROPEAN AGENCIES FOR APPLYING PSYCHOLOGY IN BUSINESS

England. In England there was organized as early as 1915 an Industrial Fatigue Research Board supported by government funds and under the direct supervision of the Medical Research Council. It was the duty of this Board¹ "to undertake to promote better knowledge of the relation of hours of labor and other conditions of employment, including methods of work, to functions of the human body, having regard both

¹Second Annual Report of the Industrial Fatigue Research Board to 30th September, 1921. H. M. Stationery Office, London, 1922.

to the preservation of health among the workers and industrial efficiency; and to advise the Council upon the best means of securing the fullest application of the results of this research work to the needs of industry." Important investigations in the application of psychological and physiological principles to industry and commerce are being carried on by the Board even at the present time, in spite of a restriction in budget during 1922.² "The activities of the Board are, however, necessarily confined to broad surveys and investigations and it was felt by many firms interested that much of the value of its work would be wasted unless assistance could be obtained in the application of the principles to the special needs of individual firms. In order to meet this need a National Institute of Industrial Psychology has been formed. This was incorporated in February, 1921, as an association for scientific research. It has the support of a number of well-known business men and in addition has a scientific advisory committee consisting of the heads of psychological, physiological and educational departments of universities throughout the kingdom who are interested in the practical application of the sciences of psychology and physiology. Private individuals have come forward with generous financial support, and in addition the Carnegie United Kingdom Trust is giving substantial help. Where investigations are carried out which are likely to result in an immediate advantage to a firm, fees are charged which cover the salaries of the investigator and include overhead charges of the central body."

The Institute is under the direction of Dr. C. S. Myers, formerly director of the psychological laboratory of

Cambridge University. By arrangement with the Industrial Fatigue Research Board the services of their investigators may be utilized when required to supplement the work of the Institute's investigators.

In addition to these two organizations certain business firms such as Rowntree and Company, York, Lyons, London, have established psychological research departments. However, in England probably not over a half a dozen firms have such research departments. Other firms are endeavoring to utilize their employment managers for the purpose of making psychological investigations.

Psychologists attached to universities, such as Professor Pear of Manchester, Bartlett of Cambridge and others are working on investigations in selection, fatigue, monotony, etc., with the aim of improving the application of psychology in business. The National Institute of Industrial Psychology and to some extent individual firms are in the habit of "farming out" to university psychological laboratories problems which do not lend themselves readily to immediate factory investigation or upon which preliminary work must be done under the more standard conditions of the laboratory.

Germany. In Germany investigations in the industrial application of psychology were started during the war simultaneously with the application of psychology in furthering war aims. As early as 1916 Moede and Piorkowski began working on the selection of chauffeurs for the army and soon 14 workshops were engaged upon this problem in Germany, some of which were directly interested in civilian application. In 1917 a laboratory was established in Dresden by the Saxon Railway Co., for the selection of locomotive engineers and other employes. Early in 1918 the Greater Berlin Tram-

² From the statement by Dr. C. S. Myers in the *Journal of Applied Psychology*, September, 1921, pp. 290-91.

ways began investigations on the selection of motormen, and today its psychological laboratory is among the best equipped and best organized in Germany.

After the war there came a renewed interest in the application of psychology in business which resulted in the establishment of numerous psychological institutes and the organization of psychological laboratories by private firms. The intensified interest had its root, to some extent, in the desire of the Germans to achieve as quickly as possible the economic reconstruction of the industry of Germany and of the state itself. Applied psychology found ready acceptance by the industrialists and workers alike as a measure which would help in the utilization of the dwindled man power of Germany. It was recognized that unit cost of production could be decreased only by substituting the most efficient use of human effort for the advantages in low cost of raw material and the large working population possessed by Germany before the war, and that only by decreasing cost of production could Germany hope to compete with other manufacturing countries and regain her place in the economic world. Other factors favorable to the development of industrial psychology were also present but this, more than any other single motive, contributed to the growth of the agencies for the application of psychology in business briefly described below.

In July, 1922, twenty-two large concerns in Germany possessed their own psychological laboratories. The number today is approximately double that and includes such large firms as Krupp, Essen and Kiel; Carl Zeiss, Jena; Allgemein Elektrizitätsgesellschaft, Berlin; Auerlichtgesellschaft; Osram-Werke Siemens Company; Loewe Company; Greater Berlin Tramways and others.

Psychological laboratories, subventioned by the state, have been opened in connection with the administrative offices of the railways in Berlin, Dresden, Frankfort, Mannheim and Cologne. In addition, in other governmental departments, such as the post office in Berlin and the telephone service, psychological research departments have been organized.

Institutes for the industrial application of psychology are to be found in all of the larger cities in Germany. In Berlin there are several: the Psychotechnical Institute of the Charlottenburg Technische Hochschule; the Institute of Applied Psychology under the direction of Dr. Lipmann; the Institute of Industrial Psychology of the Commercial High School of Berlin; and the Orga-Institut.³ The latter is a private business firm. In Munich, Dresden, Mannheim, Halle, Hamburg, Hanover and elsewhere are found other institutes. Some are attached to universities or technical schools; others are supported by the contributions of individual firms. All cooperate with industry and even firms possessing their own psychological laboratories avail themselves of the services of these institutes.

In universities, the psychological laboratories are doing research work in the application of the science in commerce and industry.

France. In France the agencies for the application of psychology in industry are very few in number. In Paris there is a *Service libre de prophylaxie mentale* at the *Asile Clinique* which functions in giving vocational guidance.

³ An interesting feature of the work of the Orga Institut (the director of which is Dr. Curt Piorowski) are the courses on "psychotechnique," given for the industrial people of Germany and visitors from other countries at regular intervals. These include visits to the psychological laboratories of firms in the immediate neighborhood of Berlin.

The assistant director of this clinic, Lahy, is making investigations in the application of psychology in industry. At the *Laboratoire de Physiologie du Travail du Conservatoire Nationale des Arts et Metiers*, important work on fatigue in industry and on physiological tests for the selection of workers is being done by Amar. Similar work is being done by the *Institut Lannelongue d'Hygiene Sociale* in Paris. In Lyons, Strassbourg and in a few other cities there are vocational guidance institutes which are conducting investigations which may have an ultimate application in industry.

The writer knows of no firms in France which have already established a psychological laboratory. The street railway company of Paris is at present organizing such a laboratory of which M. Lahy will take charge.

THE RANGE OF PSYCHOLOGY IN EUROPEAN BUSINESS

In the three countries under discussion the scope of the application of psychology to business is somewhat the same. The functions of the psychologist in industry in England, as gathered from statements made by English psychologists, can be ranged under the following heads:

1. Study of the requirements of occupations and the elaboration and application of suitable tests so as to secure (a) the scientific selection of workers and (b) more reliable guidance for children when choosing their life's work.

2. Investigation of the best methods of applying human energy with regard to (a) the elimination of unnecessary movements; (b) advantageous distribution of rest periods and (c) the reduction of monotony and increase of interest, etc.

3. Realization of conditions (a) in regard to lighting, ventilation, etc.,

which tend to the maximal health, comfort and well-being of the worker, and (b) in regard to methods of payment, labor representation etc., which tend to the best relations between management and labor.

4. Training of workers with reference to the psychological principles involved in learning and habit formation among beginners; the training of foremen, etc.

5. Study of the factors influencing the sale of products, e.g., advertising, designing, etc.

In the first issue of *Praktische Psychologie*, a journal devoted almost exclusively to developments in industrial psychology in Germany, the scope of industrial psychology is given as:

1. Vocational selection and vocational guidance.

2. Rationalization of training and methods of work.

Under this heading are included not only the problem of investigating the best methods of training and the best methods of work but also the determination of the best conditions of work.

3. Rationalization of organization, i.e. the determination of the best types of industrial organization.

4. Merchandising technique, i.e. the psychology of advertising and salesmanship.

In France approximately the same functions are assigned to the psychologist in industry. In other words, the field charted for exploration in all three countries is practically the same. Emphasis has come, however, at different points.

England, up to the present time, has specialized largely in the investigation of the best methods of applying human energy in the determination of the best conditions of work and in investigations of relations between management and labor. In Germany, on the other hand,

the emphasis has been on the preparation of tests for the selection of workers. Important work has also been done in other fields but, from the point of view of the number of experimental investigations and the extent of application in industry, the development of selection tests in Germany, as in America, occupies the first place in the application of psychology in business. In France actual accomplishments are largely in the nature of physiological investigations in fatigue and selection. A number of investigations on vocational selection and methods of work have also been carried through.

Before giving a brief summary of actual results secured from the application of psychology to business in England, Germany and France, it may not be amiss to discuss certain tendencies that are apparent to the observer. It is only from a consideration of such tendencies and actual results that a comparison with progress in the United States can be drawn or any prediction made as to the outlook for the future abroad.

TENDENCIES IN THE APPLICATION OF PSYCHOLOGY TO BUSINESS IN EUROPE

1. Perhaps the most significant trend in the application of psychology to business in England, France and Germany is in the direction of a scope or range that is greater than in the United States. Psychologists over here have limited themselves almost entirely to selection, and to a minor degree to advertising. Only in occasional instances are contributions made in training, in measuring industrial fatigue, in determining best methods of work and best conditions of work. The latter applications especially have been looked upon as the field of the efficiency engineer and encroachment upon this field has been frowned upon both by the efficiency engineers and the psycholo-

gists. By the foreign psychologists all business is interpreted as a series of human reactions—man upon man, man upon machine, upon material, etc. The examination of every aspect of these human reactions, whether it be the method of work or the vocational abilities of the individual, the best program for training the man or for influencing to buy goods, is assigned to the specialist in human behavior—the psychologist.

2. It is as students of human behavior that the psychologists in the countries under discussion have taken over the work to increase human efficiency in industry through fatigue study, time and motion study, etc. On the surface it may appear that they have become, in their respective countries, the leading advocates of the Taylor system, an unmodified Gilbreth program of fatigue study and similar programs suggested to date by efficiency engineers. On the contrary, the psychologists in Europe are the most enlightened and the most severe critics of the Taylor and similar systems for increasing industrial efficiency. They condemn in these programs, in no uncertain terms, the neglect of the workers' well-being, the sacrifice of his "maximal health" and comfort.

In an address before the British Psychological Association, Myers summarizes the difference between efficiency engineers and industrial psychologists.⁴ "By nature and through his training the efficiency engineer is prone to regard human workers as machines. Rather than understand them he would mould them to a common type. . . . The industrial psychologist (on the other hand) recognizes and investigates the various (emotional and intellectual)

⁴ C. S. Myers, "The Efficiency Engineer and the Industrial Psychologist," *Journal of the National Institute of Industrial Psychology*, Vol. 1, No. 5, January, 1922, p. 171.

factors that invariably enter into and influence the form of the work curve, and the different play of these various factors, at different times of the day, with different kinds of work and with different workers."

In Germany, also, psychologists are extremely critical of the Taylor system and other efficiency programs. This criticism is not as severe as that just quoted, but expression has been given to the psychologist's recognition of the gaps in these systems. Dr. Lipmann, for example, criticizes the Taylor system as going too far, and often without utility, in the direction of transforming "free work" into "task work." He also doubts whether there is only "one best way" of performing an operation.

Lahy, of Paris, in a study on fatigue, also points out the danger of cumulative fatigue resulting in the temporary or permanent loss to industry of a trained man in establishments employing the Taylor system.

The criticism of the Taylor system, the Gilbreth concept of fatigue and his method of studying fatigue and the time and motion studies of the efficiency engineer has not deterred the psychologists of England, France and Germany from accepting some of the methods of the efficiency engineer and in modifying others for the study of human reactions in industry. In other cases he co-operates with the efficiency engineer, as he co-operates with physiologist, with psychiatrist, with educator in the study of industrial problems. But—and this is particularly true of England—his point of view remains different; he is primarily interested in human behavior, in human efficiency, and only secondarily in machines. He seeks to make industry more efficient, but he believes that it can be done only by considering the maximum well-being of the human element in industry and

never by the sacrifice of this human element to production. He believes, also, that for true efficiency there can be no separation of the field between efficiency engineer and industrial psychologist, but that to the latter should be assigned in its entirety the problem of making human beings efficient in industry.

3. A corollary to the above is a recognition of the need of interesting the worker, individually and as a group, in the application of psychology in business. The psychologists who work in industry in America are impressed with the importance of gaining the confidence of the worker in the plant, but in England and in Germany the concern extends further than to the workers immediately involved. There is a conscious recognition of the fact that organized labor, as a body, is intimately concerned in the application of psychology in business; and labor, much more than is the case in the United States, is asked to coöperate and does coöperate in the formulation of a psychological program for industry. For example, at the time that the National Institute of Industrial Psychology was being organized in England, in February, 1919,⁵ "with the help of Mr. G. D. H. Cole a meeting was arranged in Fabian Hall between a number of representative labor leaders and members of the organizing committee." Discussions were also held in educational conferences of workers.

Coincident with the psychologist's concern in interesting the workers is a positive interest on the part of labor in the psychological program, an interest somewhat in contrast to the absence of interest on the part of American labor.

⁵"The Early History of the National Institute of Industrial Psychology," *Journal of the National Institute of Industrial Psychology*, Vol. 1, No. 1, January, 1922, p. 2.

In England it is noted that it is evident⁶ "that the problem of the application of science to the human side of industry was being considered widely both by workers and by management." In Germany the movement for the application of psychology has the sympathy and support of the trade unions. The unions realize⁷ "that it is to their advantage to have within their ranks only men who are capable. The union suffers as badly from its misfits as the employer." The Berlin Trade Unions make an annual contribution toward the support of the *Psychotechnical Institute of the Charlottenburg Hochschule*, which is functioning particularly in the selection of apprentices for the metal trades. Passing the test has been made a condition of apprenticeship. The Dortmund Union is also using tests in the selection of apprentices to learn the trade. Resolutions recently adopted by the Federated Trade Unions of Germany favor the establishment of scientific vocational guidance. In the Krupp works, in Essen, an association of over 250 workers has been formed to study the accomplishments in the application of psychology in industry.

The attitude in England and Germany on this point is summarized in the statement by the Industrial Fatigue Research Board that it is important that⁸ "responsibility for the initiation and prosecution of the work should be shared, so far as possible, between the employer's and workmen's representatives working together." With

this the writer finds himself in fullest accord.⁹

4. Another outstanding tendency in England, Germany and France is that which emphasizes the importance of close coöperation between laboratory and factory organizations. It is felt that the psychologist must go out into industry in order to carry on his research, but it is also believed that in certain cases factory investigations should and *must* be substantiated by laboratory investigations. This tendency is motivated by the belief that certain aspects of industrial psychology can be investigated scientifically only under the impartial and standard conditions of the laboratory and that the time taken for factory investigations can often be substantially shortened if preliminary work is done in the laboratory.

5. In the use of selection tests in all three countries under discussion, as in the United States, much emphasis is being placed upon the need of developing personality tests to supplement the tests of vocational ability now in use. The importance of temperament in vocational success and in stabilizing industry is recognized everywhere, and experiments are being conducted throughout Europe in the development of such tests. In Germany, France and England, nothing more has been accomplished in this direction than in the United States.

6. In the United States the psychologists have occupied themselves more than their European colleagues with the analysis of the requirements

⁶ *Ibid.*, p. 3.

⁷ G. H. Miles, "International Conference on Vocational Guidance," *Journal of the National Institute of Industrial Psychology*, Vol. 1, No. 1, January, 1922, p. 17.

⁸ Second Annual Report of the Industrial Fatigue Research Board, H. M. Stationery Office, London, 1922, p. 15.

⁹ The agreement for setting joint standards between operators and unions in the garment trade in Cleveland and Rochester is an example of such coöperation in the United States. Direct coöperation between labor and the scientific worker, even in investigations leading to immediate results, appears, however, to be less usual in the United States than in Germany and England.

of jobs. Dr. Lipmann, of Berlin, and others have made investigations along these lines, but in methods and results their work does not compare with the important contribution in the preparation of job specifications made by psychologists of this country.

7. The importance of checking up the reliability of psychological methods and effect of applying psychology in business upon business efficiency finds constant repetition on the part of the psychologists in the countries under discussion. This is particularly emphasized in the case of psychological tests, although concurrently with the discussion of the importance of checking up test results with vocational success there is much discussion of the difficulty of finding adequate criteria of vocational success. Output records, ratings by supervisors, ratings by fellow workers are all discussed, but this discussion only serves to point out the inadvisability of accepting any of these as a single criterion of vocational success. In like manner, in England and Germany, as in America, the problem of evaluating in terms of cost accounting the effects of a particular item of a psychological program in an industrial plant is receiving considerable attention.

In this connection it is my impression that the approach to the problem of applying psychology in business is much more conservative in England than in Germany.¹⁰ There is apparently greater readiness in England on the part of investigators in industry to wait longer for results; there is a willingness to examine carefully existing

concepts and points of view before starting large scale programs of applying methods and programs founded upon new, relatively untried concepts. There is greater restraint in the report of investigations and in the claims made of the benefits of any particular investigation. Partly this may represent a traditional conservatism of the English scientific worker; to a greater extent it is probably an outgrowth of the different effect of the results of the war and of industrial depression upon the new science in England and in Germany.

The industrial depression which set in during the summer of 1920 in England retarded the development of the application of psychology in business in the same way as the industrial depression in America retarded the application here. Shortly after the close of the war there was a period of industrial inflation in Germany (as in other countries) upon the crest of which the application of psychology in business, as one means of making industry more efficient and using the dwindled manpower of Germany to the best advantage in gaining the markets of the world, took hold in industry. And during the period of industrial depression in Germany the motive of setting on its feet a rapidly sinking Fatherland was still present to support the introduction of a program designed to reduce the cost of production in industry. The relative weakness of this motive in England, combined with the English conservatism, served to retard in England the extent of the application of psychology under conditions which made for increased application in Germany. On the other hand, the sudden rise of application in Germany was characterized by a desire for immediate results which have led—in Germany as in America—to occasional overestimation of a particular investigation, particu-

¹⁰ In France the conservatism is in the direction of non-application. In this country it is not so much a question of conservatism in method and claims as a retardation in the application of psychology associated probably with the more pronounced and traditional objection to change on the part of both industrialists and workers.

larly in the field of vocational selection. It is probably more true in Germany than in England or in France that ¹¹ "very grave errors are being committed in the zeal for using psychological tests" and in other forms of application, but these errors in application do not affect seriously the basic, intrinsic value of the application of psychology in business.

8. Finally a trend which is worthy of a few words is that of keeping the movement for the application of psychology in industry closely associated with the vocational guidance movement. It is felt that in the formulation of a program for the use of individual effort so as to achieve the greatest happiness of the individual and his maximum efficiency in the industrial and social organization the two movements are complementary. The research laboratories and the psychological institutes of Europe, as those of America, are conducting investigations in the vocational guidance of youth as well as in the direct application of psychology in business, and the industrialists and workers indicate their recognition of the relationship between the two problems by contributing toward the cost of these investigations.

ACCOMPLISHMENTS IN APPLYING PSYCHOLOGY TO BUSINESS ABROAD

It is possible to sketch only briefly the actual accomplishments in the application of psychology in each of the countries.

England. In England the Industrial Fatigue Research Board has devoted considerable attention to the study of fatigue with a view to increasing the efficiency¹² of the human factor in industry. Investigations have been

carried on by the Board in the iron and steel industry, the cotton industry, silk weaving, boot and shoe industry, munition factories, the pottery industry, the laundry trade, confectionery trade and metal polishing. Certain important findings have been revealed in these investigations. For the measurement of fatigue produced by work no satisfactory test has, as yet, been evolved. With reference to the hours of labor Vernon¹³ "showed that the long hours of employment introduced ostensibly to bring about increased production resulted in many processes in such a reduction in hourly output as to more than counterbalance the additional time available for production, so that the total production was actually less than when the hours of work were subsequently reduced." The same investigator presents evidence to show that¹⁴ "lost time in the eight-hour shift (on blast furnaces) is less than on the twelve-hour shift and that the efficiency with which the blast furnaces are run is correspondingly increased."

Experiments on rest pauses showed ¹⁵ "that the onset of fatigue is checked by the systematic introduction of rest pauses." Thus in an experiment with rest pauses in a shoe plant the¹⁶ "average output from six presses was increased by 44 per cent without the addition of new machines and with a reduction in the working hours of the individual operative."

With reference to conditions other

¹² The term *efficiency* in the reports of the Board is not to be interpreted as equivalent merely to productive efficiency, but as the physiological quality which results from favorable conditions of work. The word is, in fact, almost equivalent to *fitness*.

¹³ Second Annual Report of the Industrial Fatigue Research Board, H. M. Stationery Office, London, 1922, p. 25.

¹⁴ *Ibid.*, p. 34.

¹⁵ *Ibid.*, p. 37.

¹⁶ *Ibid.*, p. 63.

¹¹ Harry D. Kitson, "Vocational Guidance in Europe, School and Society," Vol. XVI, No. 415, Dec. 9, 1922, pp. 645-50.

than hours of work it was found in the tinplate industry and other trades that output was greatly influenced by the temperature of the environment. Under artificial illumination, it was concluded by one investigator, production falls, even if electric light of sufficient intensity is provided. Thus in a study of output in silk weaving during the winter months it was found that¹⁷ "a gradual increase in production occurs from December to March, coinciding with the lessened use of artificial light, under which production appears to fall about 10 per cent as compared with daylight." The general conclusion of the Board from this type of investigation is that¹⁸ "the chief immediate value of this type of investigation is perhaps less in actual discovery than in enabling definite numerical values to be attached to the effects observed. . . . The investigations also have an immediate and wider aim in that they form the principal means of studying first principles relating to optimum conditions of work for the operatives of the future."

Investigations for the determination of optimum conditions have also been carried out by the National Institute of Industrial Psychology and individual investigators. A study of mine illumination resulted in a considerable increase in production and a greater feeling of comfort among the workers. Rest pauses introduced in the factory of a large London catering firm resulted in an increased production of 5.47 per cent in spite of a reduction of 3 per cent in the hours worked. Likewise in candy manufacturing the introduction of rest pauses and change of work resulted in a 14 per cent increase in production and a universal feeling of satisfaction on the part of the workers. Similar investigations have been

started under the auspices of the National Institute of Industrial Psychology in a Lancashire firm of calico printers, a firm of margarine makers, and elsewhere.

A second important field in which there have been significant accomplishments on the part of the psychologist working in industry in England is in that of improving methods of work. This, as has been indicated in the previous section of this paper, is definitely recognized to be within the field to be studied by the psychologist. Time and motion studies are both used in the determination of the best methods of work.¹⁹ "Time study is used, however, only to determine the time certain operations took to perform and not to set time standards. . . . Motion study is used not to determine the movement that takes the *shortest* time, but to discover that which the worker would find *easiest* to perform." Investigations of this nature by Farmer of the Industrial Fatigue Research Board in dipping chocolates led to an increase of 88 per cent in production after three months on the part of new employees. An investigation along these lines by the National Institute of Industrial Psychology in a large colliery yielded an increase of 16 per cent and the hearty appreciation of the miners for the work done on their behalf. Similarly favorable results followed the investigations by this organization in chocolate packing, baking and cabinet making. The rearrangement of the compositor's layout on the basis of an investigation in the Cambridge Laboratory reduced hand movements of hand compositors 20 per cent and resulted in a saving of fatigue and an increase of efficiency. In a like manner an investigation combining methods of work

¹⁷ *Ibid.*, p. 63.

¹⁸ *Ibid.*, p. 43.

¹⁹ Second Annual Report of the Industrial Fatigue Research Board, H. M. Stationery Office, London, 1922, p. 50.

and surroundings resulted in a reduction of breakage of crockery amounting to 53 per cent on the average in the stores of a firm conducting a chain of restaurants in London.

In the development of tests for vocational selection only meagre results have been obtained in England. A series of tests for clerical ability, including stenographers and typists, have been worked out by Burt and are already considered to be sufficiently reliable to be used in industry. Muscio has found significant correlations between certain tests and a number of jobs in the printing trades. These have, however, been standardized on only 24 subjects. A number of experiments, yielding negative results, have been carried out with physical tests for industry. Tests are being used for selection in a large cocoa and chocolate factory. Laboratory investigations in devising tests for shop work, for engineering, dressmakers, weaving and foremen are being carried on by different psychologists.

In the matter of training, little has been done. A number of the retail stores in England are just beginning to develop training programs with the help of the psychologists. In the course of occasional investigations in the method of work, etc., instruction has been given in the correct method of work by the psychological investigator. Likewise in the field of advertising and designing there have been no important applications of psychology. The National Institute of Industrial Psychology is carrying on an investigation in this field, but no results have been obtained to date.

In the field of general organization of industrial enterprises, psychological experiments in such matters as monotony and interest are being carried on by individual investigators. As yet, no important results have been announced.

Germany. In Germany the greatest attention has been given to the selection of competent workers by means of psychological tests. In this field more has been done in the selection of apprentices for the metal trades than in any other trade. An inquiry made late in 1921 showed that half of the large metal works in Germany were using psychological tests in the selection of workers. Since that time additional firms have started to use such tests so that at present the greater majority of German machine shops use them in the selection of workers. The very complete records kept by the larger manufacturing firms show that vocational tests have resulted in a much better type of accepted worker. In the published statement of a number of these firms it is noted that relatively few of the apprentices selected by means of tests are dropped by reason of unfitness, as had formerly been the case with many, after the apprenticeship course had been started. As a matter of fact, the results of tests carried out in 1921 which have been followed up show that in round numbers less than 6 per cent of the records were unsatisfactory, while the work of 66 per cent of the pupils was stated to be very good.

In the field of street car operation there has also been a wide-spread use of selection tests, particularly in choosing motormen. The report is made by the Greater Berlin Tramways that there was a reduction in the number of serious accidents from 1.6 to 1.1 and of minor accidents from 42 to 29 per 1,000,000 kilometers, a decrease of 50 per cent in the length of the training and a marked reduction in the use of current and the cost of repair after the introduction of psychological tests, improved method of training and a change in organization based upon psychological principles. According

to Dr. Piorkowski a saving of over 12,000,000 marks (July, 1922) had been achieved in one year. In Hamburg and other cities similar tests are being introduced. The State Railways have also introduced vocational tests both for their workers on the railway (engine drivers, plate layers, supervisors, etc.) and for candidates for the four years' training course in their repair shops.

Since 1921 tests have been used in the selection of long distance telephone operators in Berlin. In September, 1922, 400 applicants for this job had already been examined and the results had been so satisfactory that plans were under way for the institution of similar methods outside of Berlin.

The reports from the Osram Company (manufacturers of electric bulbs) indicate that tests instituted for the transfer of unsatisfactory workers within the plant, for the selection of workers, salespeople and for the selection of candidates for a bonus of a technical education granted by the firm are functioning very satisfactorily.

These are perhaps the outstanding examples of post-war application of tests in Germany. In other fields, in the selection of firemen in Dresden, in the selection of apprentices for the printing trade in Leipzig, of police officials in Berlin, of hair dressers, of typists and stenographers and in a number of other trades, tests are being used. In many cases the reliability of the tests has not been adequately checked. In general reports on the tests—verbal and written—are very favorable. The fact that industrialists in Germany who have started this work are continuing and extending it would seem to substantiate further the belief that, in general, the introduction of selective tests has resulted in improved selection of workers.

Progress has also been made in the

determination of the best methods of work and the training of workers in these methods. The outstanding accomplishment in this field is the work of Tramm with motormen in Berlin. Another important piece of work with an ultimate application in industry is the very thorough comparison of efficiency, from the point of view of the fatigue of the worker as well as production, of the sight and touch system of typewriting and the investigation of the arrangement of the keyboard and the construction of the typewriter from this same point of view. The need of important changes in the typewriter was revealed in this study.

In the determination of the best conditions of work, studies have been made in the street railway industry, at the telephone exchanges and in other industries. A few laboratories and industrial plants have also made studies of fatigue. In this field, as in the determination of the best methods of work, the accomplishments in Germany are behind those in England.

In the study of the application of psychology to advertising, Germany appears to be ahead of England. Slight application of findings has been made, but the statistical studies of the "attraction value" of different kinds of posters and newspaper advertisements, made by the Institute of Industrial Psychology of the Commercial High School of Berlin, the study of the influence on legibility and memory of distances between letters in words of ads, and the study of the "attraction value" of different kinds of light, colors, decorations, price tags, etc., in show windows, made in Dresden and Mannheim, have revealed findings which can ultimately be applied in making advertising more effective. The work of Hans Piorkowski, Dresden, in selecting an easily recognized trademark not susceptible to confusion with

others for the motion picture apparatus to be manufactured jointly by Krupp's, Essen and the Erneman works, Dresden, is an example of the practical application of psychology in advertising.

France. In France the actual results from the applications of psychology in business are exceedingly limited. Lahy, of Paris, has devised selection tests for typists and stenographers. He is also studying the movements of motormen and is expecting to develop a test for the selection of motormen. He has also made a study of the efficiency of typists. Laboratory investigations in the measurement of fatigue have been conducted by Lahy, Amar and others, and Amar is at present working on physiological tests for the selection of workers which are of interest to the psychologist. In Lyons and Strassbourg the vocational guidance bureaus are working on tests for the differentiation of vocational abilities.

The methods followed in the achievement of results in England, Germany and France, cannot be discussed in this article. In general, particularly in selection, they follow very much the lines adopted for achieving similar results in America. A significant trend in method which deserves a few words is the tendency noted by the author in certain quarters of Germany toward the mechanization of apparatus used in testing in order to make it both self-administrative and self-recording. Cost of administration is thereby lowered. There is some objection to this method in Germany itself. The English psychologists, on the other hand, are most consistent in their emphasis that the tests, particularly in the early stages of industrial testing, should be administered by examiners with a thorough psychological training who are capable of interpreting the performance qualitatively as well as

quantitatively. The writer agrees with them and with those psychologists in Germany who believe²⁰ "there is a danger that if tests are applied by persons without requisite training their value will be greatly diminished and much information which would aid future progress will be lost."

THE OUTLOOK FOR APPLIED PSYCHOLOGY IN EUROPE

It appears unnecessary to include in this article a discussion of the qualities of the science of psychology and the factors outside of it which limit the application of psychology in business. In Europe these are practically the same as in the United States and they are treated at length in articles describing applications in our country. The outlook for the growth of the application of psychology in business in England, Germany and even in France, in spite of the paucity of actual accomplishments in that country, appears to be a very favorable one. There is a genuine and growing interest on the part of employers and workers alike. The expansion during the last few years, some of them years of industrial depression, of the various agencies for applying psychology in business in these countries is evidence of this growing interest, and lends justification to the optimism which prevails among European psychologists with reference to the contribution which is still to be made to industry by their science. The character of this optimism is perhaps best expressed in a statement by Moede, of Berlin.²¹ "Summarizing the actual accomplishments to date in industrial psychology," he writes, "there is

²⁰ G. H. Miles, "The Berlin Conference in Applied Psychology," *Journal of the National Institute of Industrial Psychology*, Vol. 1, No. 5, January, 1923, p. 191.

²¹ *Praktische Psychologie*, Vol. 2, No. 10, July, 1922, p. 328. W. Moede, *Ergebnisse der industriellen Psychotechnik*.

ground both for daring optimism and doubting pessimism, but in considering the youth of this subject and the relatively short time during which basic experiments have been carried out, one is drawn to the side of optimism. If investigations to date do not give all the results for which we strive they still give enough to be of service to the worker and to management. The problem is still one of development, one

of adapting and improving the investigations until the very limit of achievement is reached. As a matter of fact the first steam engine did not give such satisfactory results as that which came after fifty years of development and, in the same way, from a zealous investigation of the many interesting problems of industrial psychology only the most satisfactory results can be expected."

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Book Department

LINK, HENRY C. *Education and Industry*. Pp. xv, 265. Price, \$2.00. New York: Macmillan and Company, 1923.

Link's new book is one that cannot be reviewed by running over the table of contents or even subheads. He was inconsiderate of reviewers. It is a book to be read—and distinctly worth the reading. Personal experiences, facts, principles and prejudices are too closely interwoven to be put into air-tight compartments. Moreover, the author, by reason of his work in industry, cannot have his opinions passed over as "academic."

In his preface—to which the rest of the book is actually related—Dr. Link states that he is not claiming scientific validity for his conclusions. They are personal opinions. "The only tests of their validity can be acceptance by educators, industrial executives, and others who have given the matter thought." He thus sets the range of appeal for his book—and what grown-up hasn't given educational matters thought? He also lets down the bars for differences of opinion, and opinions about education are as varied as they are stereotyped.

Fundamentally, the book is the statement of a problem: What are the educational opportunities and responsibilities of public educators and private business? This question is the thread on which the following chapters are strung:

- II. Industrial Motion Pictures
- III. Americanization
- IV. General Education—A. *The Responsibility of the Community*
- V. Education vs. Propaganda as an Economic Force
- VI. General Education—B. *The Responsibility of Industry*
- VII. Vocational Guidance and Industrial Education
- VIII. The Vestibule School
- IX. Trade Schools
- X. The Training of Executives
- XI. The Education of Foremen and Department Heads
- XII. The Educational Significance of Works Councils

XIII. Sub-Normal Workers in Industry

XIV. The Training of Salesmen

XV. The Basis of Industrial Education

Minor questions about the coöperation of private business and public educators, methods of instruction and content of courses are inevitably raised by the major question.

Link's opinion about the division of responsibility for education, between public and private agencies, takes shape as a formula: private business should undertake the educational or training work that directly benefits it, while public agencies are responsible for educational activities that result in indirect or distributed benefits. He recognizes, of course, that his principle "does not lend itself to making an absolutely clear-cut and final distinction." But it is a serviceable suggestion that "industry should hold itself directly responsible only for those educational activities which contribute to its own peculiar needs." We are thoroughly in accord with this principle. The National City Bank of New York, for example, by hard experience found it to be sound. The educational plan of the Continental and Commercial Banks of Chicago, to give another example, is based on it. For most educational purposes, outside facilities of a high order are available to employees. The first business of a bank is banking, not running a young university. Indeed, many concerns in various fields of business could save considerable sums of money if they followed Link's principle.

With most of Link's opinions, in fact, we cannot help finding ourselves in agreement. Business men and chamber of commerce leaders, many of them, could read and reread his chapter on "Education vs. Propaganda." It is suggested:

A large part of the extensive propaganda which is being carried on by employers and professional propagandists today should really be undertaken on a genuinely educational basis by public educational institutions. These institutions could present these facts in a comparatively impersonal disinterested manner.

Link damns out the propaganda and preachment in company papers or magazines and gives some real tips on how to run such a publication (pp. 91-95). The God-bless-you-my-children stuff that is stuck in pay envelopes is properly scored—from the point of view of sound psychology.

The chapter on "Vocational Guidance" emphasizes the crying need of informing students, in the grades, high schools and colleges about different lines of business, kinds of jobs, how to get these jobs and what to shoot for after getting a toehold. Here, certainly, is a place where business men and educators could coöperate in accordance with the practical suggestions outlined by the author.

Sound sense and good psychology have gone into the chapter on "The Training of Executives." A lot of business men could read it with profit—even the paragraph about the credulity of executives "in the face of claims made by character experts, phrenologists, physiognomists, yes, and even a few psychologists." Unfortunately, Dr. Link, the higher they are, the harder they fall.

Link has no delusions about the way people stack up: "There will always be an over-supply of hewers of wood and drawers of water" (p. 121). Indeed, it is a fair inference from the chapter on "Subnormal Workers in Industry" that many of the *nuts* can fill *dumb bell jobs*—which are in the great majority and are now filled by supposedly normal workers.

The author is biased in favor of works councils and omits trade unions not only from educational responsibility but also from the index. However, he says in his preface, "I have limited myself to those phases of the subject in which I have had actual experience." This may account for so important an omission.

It's also curious that educational guidance through conferences should have been omitted from the chapters on general education. Personal experience leads to the belief that employes are often both sadly in need of and anxious for such guidance. They need to be deflected from advanced courses for which they are not qualified into the courses that are pre-

requisite. The Three Rs should precede "Investment Analysis." They need to have the fundamentals of an education pointed out. They are likely to get precious little guidance at home—rather pressure to take some trick course that parents think will put a few more nickels into the boy's pay envelope a few weeks or months hence. And even grown-ups need such counsel. Employee guidance by competent counsel in matters of general education, as well as problems of special training, should be an important part of the educational plan of many business concerns.

Dr. Link states that "the majority of people are not much more interested in education now than when, as children, they were compelled to receive education" (p. 89). Waiving the point that he does not define the term *education* in this sweeping assertion, we can offer records and personal experiences to support exactly the opposite conclusion. In many cases the educational problem of the individual has to be analyzed *for him* and the relation of general education to responsible positions has to be pointed out concretely,—but employes can be interested. If space permitted, evidence would be offered. The trouble, too frequently, is that the case for general education is incompetently put, or not explained at all.

Differences of opinion are sure to appear among those who have given thought to educational matters. But *Education and Industry* will be helpful, partly, by provoking disagreement and causing the reader to take stock of his own stereotypes. Moreover, the "tired business man" will find much that can be applied practically, after the demands of golf relax and he can find time for an evening with a stimulating book on a serious subject.

C. H. CRENNAN.

WILLIAM T. FOSTER AND WADDILL CATCHINGS. *Money*. Pp. 409. Price, \$3.50. New York: Houghton Mifflin Company.

This book is an important and timely publication by the Pollak Foundation for Economic Research. It is a lucid exposition of complex subjects about which everybody possesses opinions as a convenient substitute for facts. The facts it contains are sufficient ammunition for some of the many

popular pamphlets which, unless all signs fail, will be needed in the next political campaign.

The starting point of *Money* is the havoc wrought by booms and depressions and their relationship to the volume and uses of money, including bank credits. Money is found to be not a "higher complication of the subject," but a useful guide. Prices are found to be not a cause, but a measure of trouble. Therefore it is useless to try to change the real cost of living by attacking prices.

The maximum productivity that is continuously possible is most likely to be maintained when there are no sharp fluctuations in the state of business activity. Under such conditions business yields the largest possible volume of consumable commodities—the largest means for maintaining a high standard of living.

In order to attain sustained production the fluctuation of the price level needs to be controlled within narrower limits. It makes little difference what the price level is as long as it is level.

The Buyers' Strike of 1920 proves to be a myth when it is shown that the volume of retail sales was well sustained long after the dealers had stopped buying. The analysis of how favorable an "unfavorable" balance of trade may be ought to be studied by those who edit the financial publications of some of our greatest banks and hold that, the more we can sell to foreign countries at a profit, the greater becomes the wealth of this country because we are getting "the other man's money." The economic gospel of Senator Ladd is aired, who would authorize unlimited issues of paper money based on land. The tendency of the agricultural bloc is revealed in Senator Capper's words, "Cheaper money means cheaper and more abundant food."

A glance at the index resembles *Who's Who in America* for it includes references to a long list of our soundest thinkers as well as our loudest talkers. The "dismal science" is not recognizable as such when purveyed with the happy illustrations with which this book teems. For instance:

Our muscles may be sore from climbing Pike's Peak, but we gain little relief from climbing down, only some more sore muscles. Business which feels the glow of unusual activity as it

rushes forward looks very much dejected when it has to go back. It brings to mind the horse that ran away, much exhilarated by the exercise, but dropped dead at the stable door, after his master had forced him to run all the way home.

The main conclusion is that the greatest service the Federal Reserve Board could render would be to seek to stabilize the price level in the United States. Admitting freely that present knowledge will not assure anything more than a rough approximation to stable prices, the rediscount rate can serve as a moderating influence. It could have prevented the greater part of the rise of prices in 1919 if it had been set at a figure higher than that of the banks with which it did the largest business.

If we had the most accurate and up-to-date index of prices now possible to construct, and if as the price index changed, changes in rediscount rates were made promptly enough, most of the extreme cyclical movements of the price level could be prevented.

The authors suggest that over four billions of gold, one-third of the world's monetary stock, should all be used as a reserve against currency and all currency made legal tender redeemable in gold, abolishing present useless distinctions. We would have, in addition to subsidiary coins, only one kind of currency—U. S. notes. The volume of these notes in circulation could be increased promptly as the price level fell and decreased promptly as the price level rose.

If an attempt were made to stabilize prices at this present level, it seems probable that our gold reserves would be sufficient to guarantee the convertibility of all the currency that would be needed under this plan for at least a generation.

En route to these conclusions the authors, good-naturedly and with excellent manners, dispose of the Edison-Ford Commodity Money fallacy and of many others. They do it so clearly that the reader, with the same material, might make a sensation in the country general store or the Pullman smoker.

Money is a sound economic study presented in a winning style comparable to William James' method of revealing psychology to a larger audience. It is an

effective blow to the belief that the alternation of prosperity and gloom is due, like the procession of the seasons, mainly to natural causes over which man has no control.

OTTO T. MALLERY.

The Third Winter of Unemployment. Pp. 350. Price, 6s. London: P. S. King & Co. (1921-1922).

This is a fact-finding study by nine qualified British investigators, including the distinguished economist A. L. Bowley and the ever illuminating employer-statesman B. Seeböhm Rowntree.

To all believers in the progress of social science the condition of the workers during this long period of unemployment of unprecedented magnitude is most heartening. Investigators find that starvation, privation and physical deterioration have been largely prevented through the measures enumerated. Public health has not declined. "The demoralization that according to pre-war theories would have been expected to result from the provision of maintenance without work has not yet shown itself." The cost to the central government and to local taxing bodies has been great, but the willingness to assume this cost has prevented the enfeeblement and deterioration of the people of England in contrast to the effect of unemployment upon some of the peoples of Europe. Statistics concerning unemployment in England are much more accurate and inclusive than those obtainable for the United States. About one-fifth of the British labor power went to waste in September, 1922. Of the population insured under the Employment Insurance Act about 12 per cent were totally unemployed and from 7 to 9 per cent on short time, making the total insufficiency of employment between 20 and 22 per cent.

The great contribution of the book is a description and analysis of the relative effectiveness of the different measures utilized to combat unemployment. Chief in scope, amount and value was unemployment insurance. In the emergency the insurance fund, however, lost its actuarial basis and approached a poor relief measure. No fault is found with its administration in

spite of the enormous difficulties inherent in separate consideration of millions of individual cases. The British Unemployment Insurance Act had the advantage of starting on a small scale before the war. After this foundation had settled, a constantly enlarging structure was solidly built upon it. Its benefits were extended to new groups and even to dependents and to include "unconvenanted" benefits outside any actuarial basis. The investigators believe that as a relief scheme in contradistinction from an insurance plan it is a mistake to place the greater part of the maintenance of the unemployed upon the shoulders of employer and employee. Where unemployed were not entitled to benefit under the provision of the insurance act, the gaps were filled in by poor law relief to from one-quarter to one million persons per month from March, 1921, to August, 1922. Free meals were provided in the schools to about one seventh of the school population during the year ending March, 1922. This relief burden upon educational funds was so heavy that the number of children fed by grants from the Central Board of Education had to be decreased.

Work was provided by local, state aided, and direct state public works. The most successful method was found when the central government assumed a share of the loan charges incurred through the capital expenditure of local authorities. This system was intended to induce local authorities to anticipate works, which they would otherwise have deferred, by the offer of the central government to pay the difference between the cost of works executed by unemployed labor during a depression and the assumed cost of undertaking them with the usual labor in normal times.

In addition two novel experiments were tried. The Trade Facilities Act authorized a guarantee by the central government of loans raised by public authorities or private companies on condition that the proceeds should be used in capital undertakings or the purchase of British manufactures calculated to promote employment. The experiment was based on a belief that the high cost of capital was a deterrent to undertakings and that by increasing the

interest rate by a government guarantee of the security work would proceed. Public utilities were the chief beneficiaries of this policy. The choice of the projects was so wise that the government will apparently suffer only an insignificant loss upon its sixty million dollars of guarantees. Even more important was the Export Credits Act, which resulted in the guarantee by the central government of selected bills of exchange created in the cause of export trade. The amount involved was over one hundred millions of dollars. Business men regard this export credit guarantee as of more use than any other single measure in maintaining and reviving ordinary commercial production during the depression. The investigators believe that both it and the trade facilities scheme should be continued in future depressions. The total cost of both to the central government, because of good judgment in selecting risks, is estimated at less than 4 per cent of the guarantees. When the value of the markets retained and of the employment given are taken into consideration, this was an extraordinary stroke of good business.

The chief practical conclusions are that in general the government's attempts to stimulate employment will be most successful if they are not restricted to the depressed localities or to the kinds of work that can be done by local unemployed. The decisive consideration should be the stimulus given to commercial activity. The stimulus is greatest if the recipients of government aid are allowed to use the most economical methods. "Even if the numbers directly employed are less, the policy of adjusting government assistance to the normal procedure of industry is likely to provide more indirect employment by accelerating general trade recovery and avoiding the waste of relief work." This conclusion is in harmony with the findings of the President's Conference on Unemployment in the United States in 1921 under the leadership of Secretary Hoover. The American recommendations, however, with the exception of the expansion and contraction of public works in accordance with the business cycle, are concerned more with the policies of private employers than either direct or indirect assistance by the govern-

ment to either industry or the unemployed. A special student of the subject should compare the "Third Winter of Unemployment" with "Business Cycles and Unemployment" (McGraw, Hill & Company, 1923) published under the direction of a committee of the President's Conference on Unemployment.

OTTO T. MALLERY.

ROSS, EDWARD ALSWORTH. *The Outlines of Sociology*. Pp. xiii, 474. Price, \$3.50. New York: The Century Company.

This book is a contribution to the pedagogy of sociology rather than to its subject matter.

When, in 1920, the author's *Principles of Sociology* appeared, making available in a single volume the system of sociology of one of the leaders in the field, it was adopted promptly as a textbook in many colleges and universities. The size of the volume, however, proved to be a hindrance in many institutions in which the time devoted to sociology is somewhat limited, so that now, primarily "to meet the demand for a shorter text for the use of those who cannot devote as much as a semester to the subject," there appears the *Outline of Sociology*, which is his larger book cut down a third, rearranged, rephrased and equipped for the class room.

Professor Ross has also added to each chapter sets of quiz questions and exercises. In a preface addressed to teachers of this text, he explains his technique of teaching sociology to university classes. These directions, the product of thirty-two years of teaching experience, are extremely suggestive.

As a textbook, *the Outlines of Sociology* is a distinct advance over the *Principles of Sociology*, and will be sure to come into even more general use than the larger work.

JAMES H. S. BOSSARD.

ROBERT A. WOODS. *The Neighborhood in Nation Building*. Pp. 327. Price, \$3.00. Houghton Mifflin Company, 1923.

The volume is a collection of twenty-eight papers and addresses given by the author, on various occasions, extending over a period of thirty-two years from 1890 to 1922.

These papers, while not expressly des-

ignated as a history of welfare effort for the period covered, nevertheless present a pretty complete moving picture of the progress of social work from its early stages 'as represented by the college settlement in the last two decades of the 19th century' down to the post-war community centre and kindred activities of the present day.

It is interesting to note the gradual development from the hypothetical and theoretical form of expression in the earlier papers to the more positive and factful form of the later ones.

In the earlier papers the scope of social work appears to be limited to the university settlement movement. The author's aim in those early papers seems to have been rather to lay down certain basic principles that should be observed by settlement workers and point out the results that should follow. The auxiliaries "might, could, would and should" abound. Gradually the author passes on from the potential mood to the indicative. The background of experience and positive accomplishment in social upbuilding affords firmer footing for specific recommendations, cautions, and exhortations to those who would attempt the difficult career of the social worker.

Each chapter is a complete unit and represents the best current thought and practice prevailing in its particular field at the time of its preparation, together with a forecast into realms then unconquered.

The university settlement looms large in many of the discussions. Yet the author's versatility carries the reader into almost every field of social endeavor, and touches practically every factor that contributes to social uplift or degradation, from the neighborhood club to prohibition, from mercenary politics to prostitution.

To the social worker, this volume should be a guide-book in theory and practice. To the general reader who is at all socially minded it should be stimulating and informing. To a lover of good English, its clearness and beauty of diction should be a joy.

HALBERT, L. A. *What Is Professional Social Work?* Pp. 149. New York: The Survey.

"Social work is the business of producing,

changing or adjusting social organization and procedure in the interests of human welfare according to scientific standards."

This is submitted as an adequate brief definition of social work. Social work may be called a business because it has become a specialized occupation. It is becoming a profession.

The italicized words are one definition which Mr. L. A. Halbert, Executive Secretary, Council of Social Agencies, Kansas City, Missouri, has given in answer to the interrogatory title of his book, *What Is Professional Social Work?*

This little volume of one hundred and forty-nine pages discusses this subject in nineteen chapters. Mr. Halbert is a social executive of some twenty years' experience and has brought to his task a well-trained mind and a habit of thoughtful, orderly procedure and a peculiarly devoted spirit. A rather unique and helpful thing about Mr. Halbert's book is a chart, neatly pocketed inside the back cover, detailing the processes of social work. Here is clearly outlined before the observer the various phases in social work as applied to: Society as a Whole; The Family; Medicine; Business; Education; Government; Agencies for Religious and Social Life; Fine Arts. These are in parallel columns and each of these divisions treated under three headings—I. Case Work; II. Group Work; III. Organization Work.

The steps enumerated in the chart, over and over again in the different kinds of Case Work, Group Work and Organization Work, are really the elemental steps in the processes of modern science. In every case the process begins with investigation, proceeds to analysis and conclusions, crystallizes these conclusions in writing, spreads the ideas, applies them to a concrete situation and tests the results. This is applied to groups of every size, from the individual up to the world, and is applied to every kind of problem, from those of health and existence to those of culture and refinement.

The book is written in plain and simple terms and with a view of being as helpful as possible to the average man or woman as well as to social workers themselves. Mr. Halbert has made a contribution in an effort to answer the question which is the

title of his book. It is interesting to note that the old and accepted professions can be named in one word: physician, lawyer, teacher, preacher, engineer; we say social work and social worker. Perhaps the contention that social work is a profession will be twice as well understood when it can be designated in one-half as many words.

SHERMAN C. KINGSLEY,

Executive Secretary,

Welfare Federation of Philadelphia.

The Negro in Chicago, A Study of Race Relations and a Race Riot. By *The Chicago Commission on Race Relations*. Pp. 672. Price, \$4.00. The University of Chicago Press.

If a race riot of the proportions that the racial upheaval reached in Chicago during July of 1919 was necessary to produce an intelligent investigation of racial conditions in a metropolitan city, then Americans are to be pitied for their stubborn lack of foresight. But if the findings published by the Commission on Race Relations, consisting of twelve of the most distinguished white and colored citizens of Chicago, appointed by Governor Lowden following the Chicago riots, will be used by other American cities to forestall the disgraceful state of affairs which Chicago experienced, our nation should be congratulated upon its willingness to accede to scientific leadership.

The report of the Commission, entitled *The Negro in Chicago*, encouched in a volume of 672 pages, later summarized and issued in a pamphlet of 78 pages, is probably the initial effort of a great American municipality to apply science to the improvement of human relations and the discernment of racial conditions. The Commission did not confine itself merely to a study of the riot but placed great emphasis on housing, industry, crime, race contacts and public opinion as they pertain to the Negro citizens of Chicago. It employed two methods of approach: first, a series of conferences were held with persons believed to have special information and experience relating to these subjects; second, a trained staff of white and colored investigators was used to determine, as accurately as possible, from first hand evidence, the actual conditions in the above mentioned fields.

Out of this cool, deep-seated play of intelligence on a human problem of massive proportions has come a voluminous assemblage of facts regarding race relations; from a study of which the Commission made to the public, white and colored, the municipality and the principal social media of the city, fifty-nine recommendations looking towards the enforcement of the law, the removal of discriminations, the industrial recognition of Negro labor, and mutual forbearance. While the observance of these recommendations is not expected to solve all racial problems, it will go far toward the removal of those causes which result in heated racial antipathy. The Commission has at least pointed out the intelligent way to promote sound relations and opinion on not only the racial relation in Chicago but in the entire United States.

OSBORNE, SIDNEY. *The Saar Question. A Disease Spot in Europe.* Pp. 384. London: George Allen and Unwin, Ltd., 1923.

Unquestionably the subtitle of this volume accurately states the seriousness of the situation in the Saar Valley. The arrangement in the Treaty of Versailles according to which the Saar mines become the property of Germany and the political control of the region passes to the League of Nations, permanent sovereignty to be determined by a plebiscite in 1935, is well calculated to cause trouble. In the present and for years to come this region will be a center of irritation and may easily prove to be one of the chief occasions, if not a cause of a later war.

Nor has the League of Nations thus far administered the region satisfactorily. One complaint after another has been presented. Some of the criticisms have clearly been propaganda for the Germans but others have had a sounder foundation in the administrative abuses of the French. Nominally, of course, the administrative authorities are responsible to the League of Nations and an attempt has just been made by the League to adjust certain difficulties. To a distant observer, however, both the methods employed and the results secured seem most unsatisfactory.

Mr. Osborne has pictured the situation on the whole quite clearly. Nevertheless,

it is unfortunate that his enthusiasm has so carried him away that his study has all the appearance of anti-French propaganda. It is highly important that a maximum of light be thrown on the Saar question and that it be done with a minimum of heat. There has been so much of sharp practice and of underhanded dealings by all nations in their relations to each other that references to "French deceit and French trickery" and other aspersions on French sincerity seem hardly appropriate. Especially is this to be noticed when there is a failure throughout the volume to acknowledge that any of the actions of the Germans during the war furnished an excuse for French irritation.

But the author's enthusiasm has carried him still further. In his chapter "The Currency Question" he fails to discriminate clearly between the difficulties due to inflation in Germany with its consequent effect on conditions in the Saar and those troubles that may properly be attributed to the introduction of the franc. Nor does it seem right to blame on the Saar Basin Governing Commission the plight of the *rentiers* when one remembers that this class has suffered such extreme losses from the rise of prices in all parts of the world. Then too, it hardly seems fair to blame the League of Nations so vigorously after pointing out so emphatically the clauses in the Versailles Treaty that have necessarily bound the League in its handling of the Saar problem.

One omission is hard to understand. Because of numerous complaints a special report of the Saar Governing Commission was presented to the League of Nations in December, 1921. In this report an attempt was made to meet some of the criticisms but this reply is ignored. Then too it is puzzling to read (p. 126) "Up to January 1919, when the French Delegation presented their first Memorandum on the Saar Basin to the Peace Conference, there was not ever demanded the separation of the Saar Basin from Germany, etc." On page 66 the reviewer had noticed the words, "France had already advanced a claim to the Saar region in a secret agreement entered into with Russia in 1917," and among the appendices (p. 375) this secret agreement

with its very explicit terminology is given in full.

These weaknesses are regrettable for there is a distinct need for a careful study of the Saar question. Reference should be made to the fact that the volume contains a map of the Saar region, although it is not very satisfactory for the purpose of the volume, while over 200 pages are filled with copies of documents.

ERNEST MINOR PATTERSON.

MASTERMAN, C. F. G. *England After War*. Pp. 311. New York: Harcourt, Brace and Company, 1923.

This is the most vivid pen picture of post-war conditions in England that the reviewer has read. It was planned several years ago but, as the author points out, its later appearance improves it. None can now so readily criticize by saying it pictures a purely transitory state. In the fact that the difficulties persist and bid fair to continue lies much of the tragedy.

In successive chapters are pictured the plight of the old aristocracy, the middle group and labor, as classes. Then the author tells of poverty stricken homes, low incomes, the "disgusting" profiteers, love of native land (or sea), babies, religion and other matters. The story is everywhere vivid and appalling. England is undergoing a terrific strain, with as yet no fundamental improvement.

Mr. Masterman avoids prophecies, quoting Froude,—"We should draw no horoscopes." Nor does he present remedies. There is no attempt to find economic or other bases for England's troubles, but chiefly a vivid recital of them. But that recital is so clear and forceful that it ought to jar the complacency of those for whom return to normalcy seems so easy.

FISHER, IRVING. *League or War*. Pp. 268. Price, \$2.00. New York and London: Harper & Brothers, 1923.

Although the title of Professor Fisher's volume does not state positively that the League of Nations is the alternative to war, there is no doubt of the author's views on the point. He makes it entirely clear that he favors our entrance into the existing League, and that our failure to enter sooner has been a tragic mistake.

The first draft of the volume was submitted by him to a large number of critics of different viewpoints, and he utilized their comments. Among them were "Republicans, Democrats, Independents, Pacifists, Militarists, pro- and anti-Leaguers, pro- and anti-Wilsonites, pro- and anti-German, French, English and Irish."

Professor Fisher's treatment is clear and forceful. He does not undertake to present details of organization, methods of handling problems or the terms of settlement of specific issues. A few such points are raised, but treated only in broad outline. The volume is an argument, a plea—not an attempt at detailed, accurate description with a careful balancing of pros and cons. As such it is valuable and convincing, although here and there a doubter might feel the claims in behalf of the League are too sweeping.

One who has not read Irwin's *The Next War* would do well to read the two volumes in succession—Irwin first and then Fisher. The two admirably supplement each other.

DICKINSON, THOMAS H. *The United States and the League*. Pp. 151. Price, \$2.00. New York: E. P. Dutton and Company, 1923.

The volume by Mr. Dickinson is more quiet in tone, less vigorous in presentation, but no less clear in its approval of the League and in its advocacy of our entrance. More space is given to the situation in Europe and more emphasis is placed on the problems that must be solved. Both volumes are worth reading by doubters, and will do much to further the pro-League movement in the United States.

E. M. P.

REES, J. MORGAN. *Trusts in British Industry, 1914-21. A Study of Recent Developments in Business Organization*. Pp. 269. Price, 10s. 6d. London: P. S. King & Son, Ltd.

Such an analysis as this book attempts is greatly needed. Factual material ought to be at the disposal of the economist, most of whose theorizing is still unfortunately and extensively based on the assumptions of free competition and *laissez faire*. The

writer had at his disposal the well-known *British Report on Trusts* and other documents. After an historical retrospect, successive chapters are devoted to the extractive industries, iron and steel, textiles, chemicals, foods, miscellaneous industries and finally banking and finance. It is to be regretted that so important a survey is marred by numerous inaccuracies, to which attention has already been called by other reviewers.

E. M. PATTERSON.

GIDE, CHARLES ED. *Effects of the War Upon French Economic Life. A Collection of Five Monographs*. Pp. 197. Oxford: Clarendon Press, 1923.

These five monographs deal with the effects of the war upon (1) the French Merchant Marine, (2) the French Textile Industry, (3) French Finance, (4) French Commercial Policy and (5) Labour in France. It will be noticed that they include the most important aspects of French economic life and taken together constitute a rather thorough survey of the economic situation in that country since the beginning of the war. The treatments are largely descriptive and raise few questions that may be viewed as controversial. French losses during the war were heavy in many lines, a tragedy clearly but temperately set forth in these essays. The story is told only through the war period and is a valuable brief record. If the various authors could have brought their studies down to date, they could have shown that the industry and frugality of the people have brought a remarkable change since the war ended, except in finances which have grown steadily worse. French economic life is today in a most satisfactory condition, marred chiefly by the state of the Government Treasury.

LEHFELDT, R. A. *Restoration of the World's Currencies*. Pp. XI+146. London: P. S. King & Son, Ltd., 1923.

This volume fails to carry out the promise of the title. It contains a mixture of acceptable generalizations about money and numerous fallacies, but fails to grapple with the real problem raised.

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